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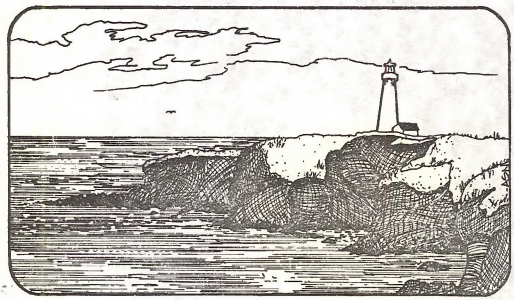
PROJECT PLAN AND ENVIRONMENTAL ASSESSMENT

YAQUINA HEAD OUTSTANDING NATURAL AREA



Prepared for:
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SALEM DISTRICT, OREGON

By:
CENTRAC
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CONSULTING ENGINEERS

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PROJECT PLAN AND ENVIRONMENTAL ASSESSMENT

for the

Yaquina Head
Outstanding Natural Area

Oregon

Department of the Interior

Bureau of Land Management

April 1986

Prepared by:

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TABLE OF CONTENTS

I. Introduction

Page

A. Relationship to Approved Recreation Area Management Plan 1
B. Project Objectives and Need 1
C. Coordination with Other Public Agencies 3
D. Location and Setting 6
E. Access 6

II. Data Analysis Summarization

A. Social Data Analysis Summary — User Profile 9
B. Physical Resources Data Summary 14
C. Cultural Resources Data Summary 17
D. Biological Resources Data Summary 17
E. Geologic Findings Summary 21
F. Functional Relationship Analysis Summary 25

III. Project Plan Concept and Design Parameters

A. Basic Improvements 27
B. Alternative I — Natural Reclamation 29
C. Alternative II — Minimal Reclamation Effort 29
D. Alternative III — Reclamation Enhancement 29
E. Alternative IV — Refined Plan: Introduction of Man to Nature 34
F. Selected Alternative 36

IV. Project Development Overview

A. Required Administrative Actions 37
B. Required Interim Use Supervision 37
C. Project Development Phasing Outline 37
D. Project Development Schedule Outline 38
E. Method of Project Survey and Design 38

V. Environmental Assessment (OR-080-6-10)

A. Introduction 39
B. Alternatives Including the Proposed Action 39
C. Alternatives Summary 39
D. Environmental Consequences 41

VI. Cost Estimates

A. Basis of Estimate 46
B. Alternative I 46
C. Alternative II 47
D. Alternative III 48
E. Alternative IV — The Proposed Action 49

Figures

	Page
Figure 1 — Summary Section 119, Public Law 96-199	2
Figure 2 — Summary of Historical Events and Actions	4
Figure 3 — Acreage by Managing Agency	6
Figure 4 — Recreation Activity Preferences	9
Figure 5 — Estimated Length of Stay by Activity	12
Figure 6 — Summary of Visitor Survey	12
Figure 7 — Marine Birds Breeding at YHONA	19
Figure 8 — Bird Migration and Wintering	20
Figure 9 — Threatened and Endangered Species	21

Plates

Plate No. 1 — Location and Vicinity Maps	7
Plate No. 2 — Topographic Map of Yaquina Head	8
Plate No. 3 — Physical Inventory/Site Data Analysis Map	15
Plate No. 4 — Reconnaissance Geologic Map	24
Plate No. 5 — Functional Relationships Diagram	26
Plate No. 6 — Alternative I: Conceptual Master Plan for Natural Reclamation	30
Plate No. 7 — Alternative II: Conceptual Master Plan for Minimum Reclamation	31
Plate No. 8 — Alternative III: Conceptual Master Plan for Reclamation Enhancement	32
Plate No. 9 — Alternative IV: Refined Conceptual Master Plan — Introduction of Man to Nature	35

Appendices

Section 119, Public Law 96-199	A — 1-2
Memorandum of Understanding Between BLM, USCG & USF&W	B — 1-2
Plants of Yaquina Head, Oregon	C — 1-11

I. Introduction

A. RELATIONSHIP TO APPROVED RECREATION AREA MANAGEMENT PLAN

This Recreation Project Plan is prepared to refine and quantify the actions described in the Yaquina Head Outstanding Natural Area (YHONA) Management Plan Decision document. It is also prepared in furtherance of Public Law 96-199, Section 119 (b)(2), which directed the acquisition of privately owned lands within the YHONA and the rehabilitation of portions of the YHONA which have been altered during nearly 60 years of rock quarrying operations.

The improvements to the YHONA which are proposed by this Project Plan are summarized as follows:

Ocean Drive improvements
Centralized parking areas
Underground utilities
Main gate/spur road gates
Entrance sign
Central visitor facility
Observation deck
Boundary fencing
Foot-trail system
Cliff area fencing/signing
Interpretive signs
General landscape rehabilitation
Quarry reclamation*

*This Project Plan is prepared to provide direction to the reclamation activity.

Figure 1 summarizes Section 119, Public Law 96-199 which established the YHONA. The full text of Section 119 of the Law is included as Appendix A.

B. PROJECT OBJECTIVES AND NEED

The improvements described in this Project Plan are needed to implement the directive of Public Law 96-199 and to serve as the basis to locate and quantify the proposed improvements sufficiently to commence project survey and design actions.

Figure 1—Summary of Section 119, Public Law 96-199 Covering Yaquina Head Legislation

1. Establishes the YHONA to protect unique scenic, scientific, educational and recreational values.

2. Charges the Secretary of the Interior to adminster the YHONA according to the laws and regulations applicable to the public lands in such a manner as will best provide for:

   a. the conservation and development of the scenic, natural and historic values of the area;

   b. the continued use of the area for purposes of education, scientific study and public recreation which do not substantially impair the purposes for which the area is established; and,

   c. the protection of the wildlife habitat of the area.

3. Directs the Secretary to develop a management plan for the area which is consistent with the Act and accomplishes its purpose.

4. Authorizes the Secretary to issue permits or to contract for the quarrying of materials from the area in a manner consistent with the management plan.

5. Restores to the status of public lands 18.1 acres reserved for lighthouse purposes in 1866.

6. Withdraws all acreage restored to the status of public lands from settlement, sale, location, or entry under the public land and mineral laws.

7. Directs the Secretary to acquire, within a 2-year period, all or any part of the non-Federal lands or waters within established boundaries of the area by purchase, exchange, donation or condemnation, except that State-owned lands shall not be acquired by purchase or condemnation.

8. Specifies that any lands or interests acquired by the Secretary shall become public lands and, upon acquisition, are automatically withdrawn from settlement, sale, location or entry under the public land and mineral laws.

9. Authorizes the Secretary to conduct a study related to wind energy research and to issue permits for the installation and field testing of an experimental wind turbine generating system if wind energy research activity will not substantially impair those values for which the area is established.

10. Directs the Secretary to develop and administer a program for the reclamation and restoration of all lands affected by quarrying operations.

11. Specifies that any revenues received by the United States in connection with quarrying operations shall be used as needed for quarry reclamation and restoration.

12. Authorizes funds to be appropriated to carry out the provisions of the Act.

C. COORDINATION WITH OTHER PUBLIC AGENCIES

Public Law 96-199 charged the Secretary of the Interior with the responsibility of administering the YHONA according to the laws and regulations applicable to the public lands.

Public Law 96-199 also restored 18.1 acres of land to the status of public lands. That area had been the major portion of the 23 acres reserved for lighthouse purposes in 1866 (see Figure 2). The lighthouse itself, and the communications site remain under the administrative control of the U.S. Coast Guard.

A Memorandum of Understanding (MOU) between the Bureau of Land Management (BLM), U.S. Coast Guard (USCG) and U.S. Fish and Wildlife Service (USF&WS) for communicating, coordinating, and implementing actions affecting the YHONA was executed in March of 1985. The full text of the MOU is included as Appendix B.

Other federal, state and local agencies have been involved in the establishment of the YHONA during the past eight years of extensive activity by the public, agencies and special interest groups. The official comments and policies of other public agencies were incorporated into the environmental assessment of the project and the Management Plan. The following individuals and agencies were consulted and/or provided input to the preparation of this report.

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Newport, Oregon 97365

The present-day resource and management situation on Yaquina Head has taken slightly more than 100 years to evolve. The major historical events and actions which have most influenced the management, development and use of the headland during this period are summarized in Figure 2.

Figure 2—Summary of Major Historical Events and Actions Which Have Most Influenced the Management, Development and Use of Yaquina Head

Date	Description of Event or Action
June 8, 1866	President Andrew Johnson, by Executive Order, reserves approximately 23 acres of public land at the tip of Yaquina Head for lighthouse purposes.
1872	Federal Government commissions the light station, and construction begins.
August 20, 1893	Lighthouse beacon goes into operation.
1925	Quarrying begins on privately owned lands, initiating a nearly continuous supply of rock material to local communities and the Lincoln County area.
January 17, 1977	U.S. Coast Guard files notice of intent to relinquish 18.1 acres of the original lighthouse reserve no longer needed for light station operation (upon revocation, jurisdictional responsibility would pass to BLM).
May 24, 1977	Oregon's Land Conservation and Development Commission, following public testimony, recommends to the State's 59th Legislative Assembly that Yaquina Head be designated an Area of Critical State Concern with full protection.

May 24, 1977	BLM invites public to participate in determining appropriate uses for lighthouse reserve lands to be relinquished by the U.S. Coast Guard.
January 9, 1978	Oregon's Governor creates a Yaquina Head Advisory Committee to find a fair and equitable method of preserving and protecting the headland.
October 11, 1978	Public Law 95-450 incorporates the Oregon Islands National Wildlife Refuge, of which the islands just off the tip of Yaquina Head are a part, into the National Wilderness Preservation System.
October 13, 1978	Yaquina Head Advisory Committee sends its final report to the Governor and the State's 60th Legislative Assembly recommending State acquisition of privately owned lands.
March 5, 1980	96th Congress passes Public Law 96-199 establishing the Yaquina Head Outstanding Natural Area.
November 1981	96th Congress appropriates $2.2 million (Land and Water Conservation Fund budget) for acquiring non-Federal lands within established boundaries of the Yaquina Head Outstanding Natural Area.
February 4, 1982	BLM acquires the Stella Wade Estate property.
April 4, 1982	BLM effort to acquire Yaquina Head Quarries property fails when additional funds needed to match the negotiated purchase price are not available.
October 27, 1982	Congressional supplemental appropriations bill provides needed additional acquisition funds and extends BLM's acquisition authority indefinitely.
March 14, 1983	BLM acquires the Yaquina Head Quarries property.
October 4, 1983	Environmental assessment covering five management alternatives issued to the public for review and comment.
December 27, 1983	Management plan decision for the Yaquina Head Outstanding Natural Area approved and issued to the public.
December 31, 1983	Quarrying operations on acquired lands to cease as specified in purchase agreement.
April 30, 1984	All personal property of Yaquina Head Quarries, including stockpiled rock, to be removed off site as specified in purchase agreement.
May 31, 1984	U.S. Coast Guard removes old residences and garage structure from light station grounds.

February 6, 1985	Lincoln County vacates Ocean Drive.
April 19, 1985	All abandoned quary-related equipment, structures, foundations, debris and trash removed off site.
January 21, 1986	BLM acquires 5.8 acre parcel from Oregon Department of Transportation.
February 12, 1986	BLM holds public informational meeting to present reclamation/improvement alternatives being considered.
March 28, 1986	BLM completes Master Plan and Environmental Assessment of YHONA reclamation and improvement.

D. LOCATION AND SETTING

Yaquina Head is located on the extreme western edge of the Coast Ranges Physiographic Province in Lincoln County along the central portion of the Oregon Coast. The YHONA boundaries lie completely within Sections 29 and 30, T. 10 S., R. 11 W., Willamette Meridian. Newport, with a population of nearly 8,000, is the largest city in Lincoln County and lies approximately 3 miles to the south. Also located near Yaquina Head are the incorporated communities of Agate Beach and Beverly Beach. The location and vicinity maps shown in Plate No. 1 illustrate where the YHONA is situated in relation to the State and the central coast and Willamette Valley region.

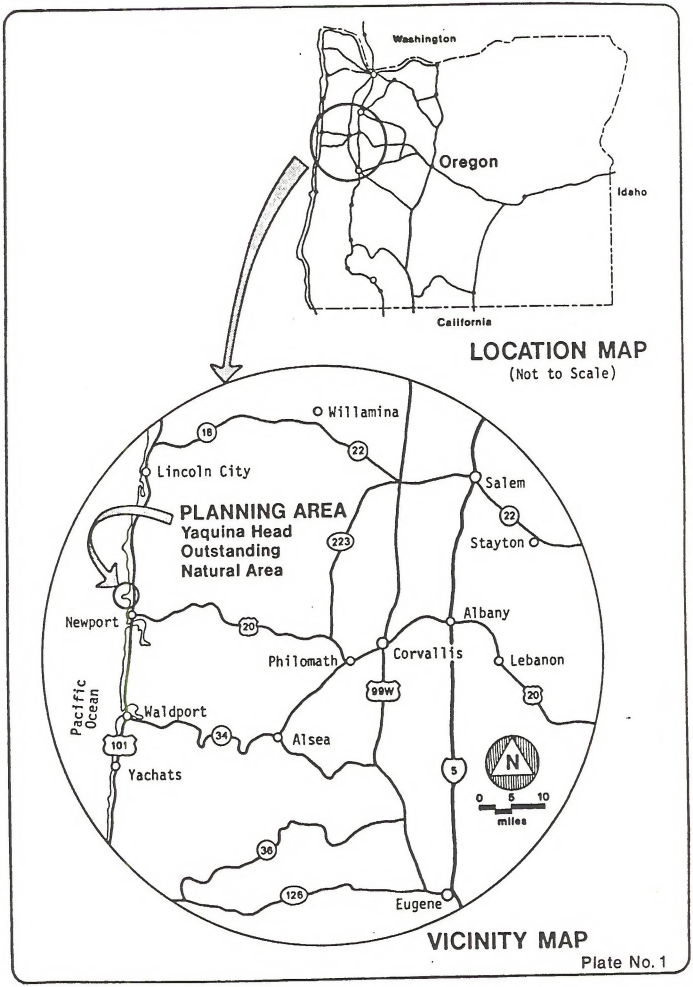
The entire area is in public ownership, comprising 99.73 acres. Figure 3 shows the acreage breakdown by managing agency, within the YHONA boundaries.

Figure 3—Acreage Breakdown by Managing Agency Within YHONA Boundaries

Government Agency	Acres
1. Bureau of Land Management	89.70
2. U.S. Coast Guard	10.03
TOTALS	**99.73**

E. ACCESS

The main transportation route to the YHONA is U.S. Highway 101, a major north-south highway extending along the Pacific Coast. During the summer months, this highway carries large numbers of tourists because of its proximity to the Pacific Ocean. Vehicular access to the tip of the headland is provided by County Road No. 39 and BLM Road No. 10-11-29 (commonly called Ocean Drive), a gravel road for the most part, which extends for approximately one mile from its junction with U.S. Highway 101 westward to the turnaround area near the light station. The junction of U.S. Highway 101 and U.S. Highway 20 in the City of Newport (3 miles south of Ocean Drive) and the junction of U.S. Highway 101 and Oregon State Highway 18 near Lincoln City (27 miles north of Ocean Drive) provide points of access for east-west travel to the Willamette Valley. Access orientation is shown in Plate No. 1, Location and Vicinity Maps, and Plate No. 2, Site Topographic Map.


Washington
Oregon
Idaho
California
LOCATION MAP
(Not to Scale)
Willamina
18
22
Lincoln City
Salem
22
PLANNING AREA
Yaquina Head
Outstanding
Natural Area
223
Stayton
Albany
Newport
20
Philomath
Corvallis
Lebanon
99W
20
Pacific Ocean
Waldport
101
34
Alsea
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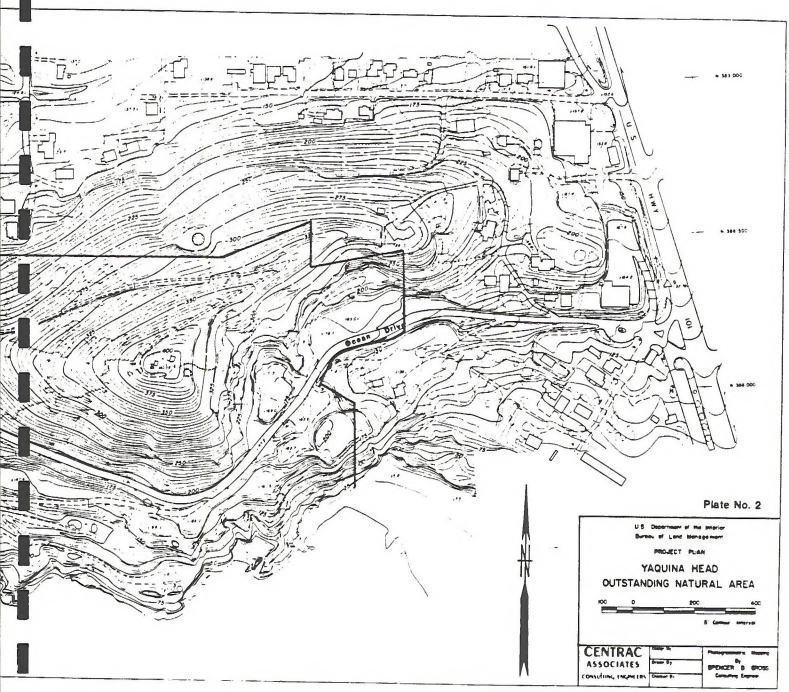
VICINITY MAP
Plate No. 1



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II. Data Analysis Summarization

A. SOCIAL DATA ANALYSIS SUMMARY — USER PROFILE

1. Recreation Activity Preferences

It is noteworthy that an area of only approximately 100 acres provide the public with such a variety of outdoor recreation activity opportunities. Yaquina Head's ability to do this is primarily due to its unique mix of physical setting and multiple resource values. Based on administrative file documentation, field observations and public comments received, Figure 4 lists the major recreation activity preferences of headland visitors.

Figure 4 — Recreation Activity Preferences and Lengths of Stay of Yaquina Head Visitors

Recreation Activity	Remarks
Wildlife Observation	Of specific interest are marine-associated birds, mammals including harbor seals, sea lions and migrating gray whales, and intertidal plant and animal specimens. Duration of visit runs from one to three hours. The visit is usually for this specific purpose.
General Sightseeing	Particularly the historical Yaquina Head Lighthouse/light station, headland scenery, seascapes north and south, and sunsets over the Pacific Ocean. Duration of visit is one-half to one hour and is typically a stop on a trip such as a family vacation.
Photography	Of specific interest are wildlife, the historical Yaquina Head Lighthouse/light station, headland scenery, seascapes north and south, and sunsets over the Pacific Ocean. Visits last from one-half to one hour and are of two types: the casual photographer on a vacation trip; and the serious photographer who comes to YHONA for specific pictures.
Fishing	From rocks on the south side of the headland. Visits average three hours in length and are typified by repeat visitors who live nearby.
Scuba Diving	Including spear fishing and crabbing. Visits average four hours in length and the typical user generally lives nearby.
Collecting	Intertidal zone by permit from the Oregon Department of Fish and Wildlife for scientific and educational collection only of non-food animals such as sea urchins and starfish. Visits are usually from one to two hours in length and are comprised primarily of people from the academic community.
Picnicking	Mainly on or near the bluffs surrounding the parking and turnaround loop at the tip of the headland. One-half to one hour visits probably by repeat visitors who also indulge in the other recreation activities while they picnic.
Hiking/ Walking	Mainly confined to the tip of the headland and to the intertidal area on the headland's south side. Durations are one-half to one hour in length and the visitors also probably take advantage of the visit to participate in the other activites as well.
Hang Gliding	Sporadic — wind and weather dependent. Visits are typically two to three hours in length. Visitors are few in number and repeaters. Use is restricted by time and location.

2. Visitation

Because an intensive, yearlong visitor use survey has not yet been completed for the YHONA, accurate annual visitation figures are not available. However, a battery-powered, inductive-loop road traffic counter was installed by the BLM on Ocean Drive just west of the upper quarry area on May 17, 1983. From that date through May 17, 1984, 64,000 vehicles were recorded traveling to and from the tip of the headland. Based on this very accurate traffic volume figure, and using an average of 3 people per vehicle for calculation purposes, it is estimated that 192,000 people visited YHONA during this 12-month period. For the next 12-month period, from May 17, 1984, through May 17, 1985, it is estimated that 183,000 people visited the YHONA. For the 2-year period ending May 17, 1985, 375,000 people visited Yaquina Head—and this use estimate does not consider those visitors who either walked or bicycled into the area or visited other portions of the headland without passing the traffic counter location. (These visitor calculations were based on visitor surveys conducted during July and August of 1985.)

With full implementation of this project plan, YHONA visitation is expected to nearly triple over the next 10 years, increasing from the present 190,000 (with minimal management) to 570,000 visits.

The intertidal area around Yaquina Head has been set aside by the Oregon Department of Fish and Wildlife (ODFW) for scientific and educational collection of non-food animals only such as sea urchins, starfish and hermit crabs. The intertidal area here is the most popular in Oregon for tidepool study. More scientific and educational permits are issued annually by the ODFW for this area than for any other collecting area on the Oregon coast (approximately 40 permits per year). Each permit issued represents an average of 70 to 80 visitors. In 1977, an Oregon State University student made actual field counts of visitors participating in collecting and sightseeing activities in the intertidal area. All counts were undertaken during a 3-hour period on 14 separate days in April and 16 separate days in May. This 90 hour total observation period yielded a count of 2,845 people. The most visitors observed during a single tide was 500.

3. Seasons and Times of Use

The public can visit Yaquina Head year round during daylight hours. From a visitation standpoint, the headland continues to be a curiosity as people are drawn to it no matter the season, day of the week, or weather condition, be it sunny and warm or inclement. Though their numbers vary, people seem to be ever present and as much a part of the headland's character today as the old lighthouse or pounding surf. As with other major points of interest along Oregon's coastline, Yaquina Head receives most of its visitation during the usually warm and inviting summer months, capturing much of the vacation/tourist traffic moving north and south along U.S. Highway 101. Summer weekend days and holidays are the most popular times of use, but summer mid-week periods seem almost as popular.

Visitation does not, however, shut down completely with the onslaught of cold, windy and rainy weather of late fall, winter and early spring. Weekend days still account for a respectable number of visitors. Even during winter mid-week periods, especially when unusually inclement weather sets in, many people visit the headland for the sole purpose of viewing and photographing the storm-whipped seascape.

4. Party Size

The number of people expected to participate as a single group or party while visiting the YHONA is variable. Most parties range from a solitary visitor to a small family unit of from 2 to 5 people. although from 40 to 60 school students arriving by bus often compose single parties destined to visit the intertidal area. Large parties exceeding 25 people often result from field trips and educational programs sponsored by Oregon State University's Mark O. Hatfield Marine Science Center in Newport. The survey conducted during summer 1985 indicated that the average group size is 3 persons. The actual average determined by the survey was 2.8 persons per party, but no large groups were interviewed during the survey.

5. Place of Origin

Although most people who visit the YHONA reside in northwest Oregon, a substantial portion of total annual visitation is attributable to out-of-state tourists. For local and regional residents, Yaquina Head is either a destination point or one of several places to be visited while at the coast. Out-of-state visitors, on the other hand, usually "find" the YHONA while traveling to and from other recreational points of interest and end up at the tip of the headland more because of its proximity to the Pacific Ocean and U.S. Highway 101 than because of its reputation. Therefore, there is no clearly established pattern to visitor origin and, more often than not, the assemblage of visitors attracted to the headland at any given time represents a blend of local, regional, statewide and national populations. More than 66 percent of the visitors in 6 percent of the vehicles traveled more than 100 miles to reach YHONA, according to the survey. Thirty-seven percent of the visitors traveled more than 500 miles and 23 percent traveled more than 1,000 miles.

6. Length of Stay

Though enforcement has been lax, overnight use of Yaquina Head for recreational purposes is administratively prohibited. A BLM sign placed along Ocean Drive near the tip of the headland, provides notice that the area is closed at night. To date, visitor compliance with regulation has been good, and little overnight use has occurred. The amount of time people spend on the headland during a single visit is activity dependent. For many, a visit of 1 hour or less is sufficient time to enjoy Yaquina Head's scenery and other intrinsic values. For others, a visit of from 1 to 3 or more hours is needed to participate in their preferred activities. Figure 5 shows estimated length of visitation by recreation activity, anticipated within YHONA boundaries. Figure 6 provides a tabulation or responses of participants in the 1985 visitor survey.

Figure 5—Estimated Lengths of Stay by Preferred Recreation Activity, within YHONA Boundaries

Preferred Recreation Activity	Length of Stay (hours)
Wildlife Observation	1–3
General Sightseeing	1/2–1
Photography	1/2–1
Fishing	3
Scuba Diving	4
Collecting	1–2
Picnicking	1/2–1
Hiking/Walking	1/2–1
Hang Gliding	2–3

Figure 6–Summary of Visitor Surveys Conducted July 24, August 10, and September 2, 1985

(Based on tabulation of vehicle licenses observed at YHONA on August 10, 1985 and September 2, 1985)

Origin	Vehicles	%
Oregon	274	65.8
Washington	62	14.9
California	29	7.0
States west of Mississippi River	36	8.7
States east of Mississippi River	11	2.6
Canada	4	1.0
	416	100.0

Miles Traveled to Site	Persons	%	Vehicles	%	Persons per Vehicle
0—10	3	1.3	3	3.7	1.0
11–25	15	6.7	4	4.9	3.8
26–50	12	5.4	4	4.9	3.0
51–100	45	20.1	18	22.2	2.3
101–200	33	14.7	11	13.6	3.0
201–500	30	13.4	11	13.6	2.6
501–1000	34	15.2	11	13.6	3.1
1000+	50	23.2	19	23.5	2.6
	224	100.0	81	100.0	2.8
Planned/Unplanned Visit					
Primary Destination	34	15.2	12	14.8	2.8
One of Several Planned Stops	140	62.5	52	64.2	2.7
Unplanned Stop	50	22.3	17	21.0	2.9
	224	100.0	81	100.0	2.8
Group Type					
Alone	7	3.1	7	8.6	1.0
Family	158	70.5	54	66.7	2.9
Friends	59	26.3	20	24.7	2.9
Organization*	0		0		0
	224	100.0	81	100.0	2.8

*Visits by organizations to YHONA are known to occur, sometimes in numbers of 40-60 persons, however none were interviewed during the survey.

Time Spent at YHONA	Persons	%	Vehicles	%	Persons Per Vehicle
0—15 min. =	87	38.9	36	44.4	2.4
16—30 min. =	84	37.5	28	34.6	3.0
31—60 min. =	31	13.8	10	12.3	3.1
61—120 min. =	19	8.5	5	6.2	3.8
120 min. plus =	3	1.3	2	2.5	1.5
	224	100.0	81	100.0	2.8

7. User Requirements

The survey of visitors to YHONA yielded limited but fairly consistent results. The visitors were there for two generalized purpose versus time spent categories:
specific purpose/long term visit
general purpose/short term visit

Those visitors who expressed having come to the YHONA for a specific purpose, such as observing birds and whales, fishing, hang gliding, marine life, or photography stayed significantly longer than those who made an unplanned stop at YHONA while on a vacation or other type of trip. The data collected during the survey, which was neither all-inclusive nor statistically valid, as well as other information assembled over the past several years indicates that there are identifiable specific facilities needed at YHONA to serve the visitors. People interviewed in the survey offered comments and asked questions which fell into four general categories: information, interpretation, guidance and warning. They wanted to know:

- *What* was at YHONA, both natural and man-made
- *How* or *Why* were the activities or phenomena there
- *When* did certain activities occur
- *How many* species of animals and birds could be found at the site
- *Where* the activities or phenomena were
- *How* the site had been scarred so badly
- *Where* they should go to take part in an activity
- *Where* could they park
- *Where* could they walk
- *Where* could they take photographs
- *How* can the quarry scars be covered
- *Where* could they go to enjoy the YHONA in solitude
- *What* dangers to themselves existed at YHONA
- *What* dangers they may be to the flora and fauna of YHONA

8. Use Areas, Facilities, and Services Needed, Based on Survey Results and other Study determinations

a. Information and interpretive areas
b. Fishing area
c. Wildlife observation area
d. Intertidal pools
e. Photography vistas
f. Whale watching area
g. Open space
h. Access to lighthouse
i. Improved parking

Facilities

a. Better access to site and intertidal area
b. More and improved parking
c. Interpretive center
d. Wildlife observation platform
e. Fencing
f. Trails
g. Utilities
h. Comfort station
i. General resting and observation platforms or benches
j. Better access to intertidal area
k. Reclaimed quarry areas

Services

a. Interpretive programs
b. Visitor information
c. Lighthouse tours
d. Tidal pool tours
e. Bird programs (in season)
f. Whale programs (in season)

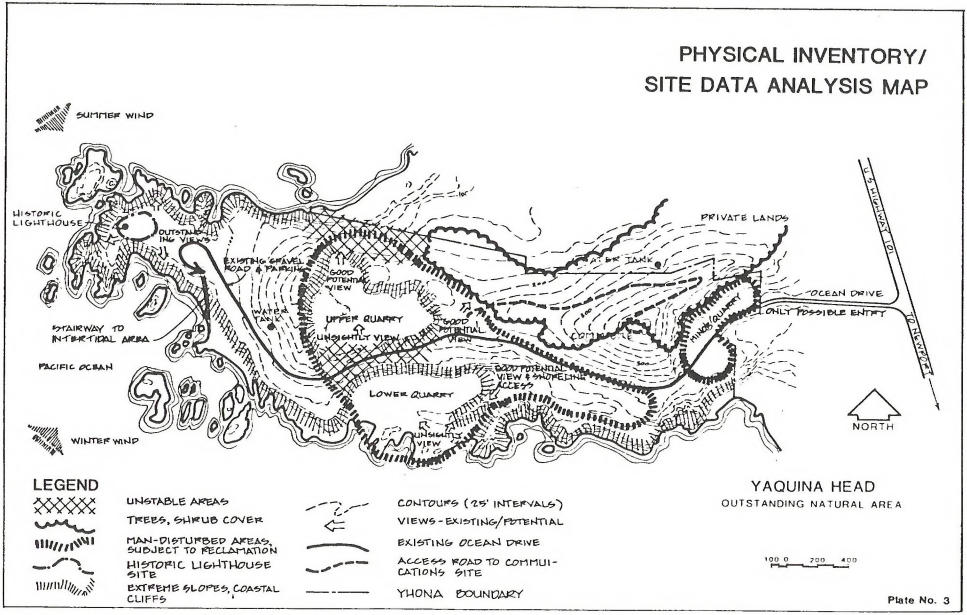
B. PHYSICAL RESOURCES DATA SUMMARY

1. Physiography

Yaquina Head, as detailed by Plate No. 3, Physical Inventory/Site Data Analysis Map, is a distinctive promontory bounded by the Pacific Ocean on its north, west and south sides. Numerous rocks and islands dot the surf just offshore, some managed as part of the Oregon Islands National Wildlife Refuge. The constant erosional forces of waves, wind and rain have weathered and removed the softer sedimentary rock at a faster rate than the overlying coarse, hard basalt. The headland has landslide-prone bluffs and steep cliffs all along the shoreline. Soils are gently sloping to steep and well drained and range in depth from 40 to 60 inches. Topography slopes gently along the broad ridgeline, and there are few flat areas other than those created by surface mining activities.

The local climate is obviously influenced by the Pacific Ocean. Its temperate nature tends to modify coastal temperature extremes throughout the year. Annual precipitation ranges from 40 to 60 inches with all but a fraction of this amount coming in the form of rain. Winter months are normally mild and rainy with prevailing winds from the southwest. Summer months are also mild but have considerably less rainfall than winter as well as a shift in prevailing wind direction from southwest to northwest.

Nearly all the precipitation falling on Yaquina Head runs off directly into the Pacific Ocean due to the impermeability of the basalt rock underlying the soil.


PHYSICAL INVENTORY/
SITE DATA ANALYSIS MAP
SUMMER WIND
WINTER WIND
HISTORIC LIGHTHOUSE
OUTSTANDING VIEWS
EXISTING GRAVEL ROAD & PARKING
GOOD POTENTIAL VIEW
WATER TANK
UPPER QUARRY
UNSIGHTLY VIEW
GOOD POTENTIAL VIEW
STAIRWAY TO INTERTIDAL AREA
PACIFIC OCEAN
LOWER QUARRY
GOOD POTENTIAL VIEW & SHORELINE ACCESS
UNSIGHTLY VIEW
PRIVATE LANDS
WATER TANK
OCEAN DRIVE
ONLY POSSIBLE ENTRY
MINES QUARRY
TO HIGHWAY 101
NORTH
LEGEND
UNSTABLE AREAS
TREES, SHRUB COVER
MAN-DISTURBED AREAS, SUBJECT TO RECLAMATION
HISTORIC LIGHTHOUSE SITE
EXTREME SLOPES, COASTAL CLIFFS
CONTOURS (25' INTERVALS)
VIEWS - EXISTING/POTENTIAL
EXISTING OCEAN DRIVE
ACCESS ROAD TO COMMUNICATIONS SITE
YHONA BOUNDARY
YAQUINA HEAD
OUTSTANDING NATURAL AREA
100 0 200 400
Plate No. 3

Yaquina Head is usually windy with velocities averaging 15 to 20 miles per hour most of the year. On occasion, winds reach velocities of 75 to 100 miles per hour.

Air quality in the Yaquina Head area is excellent. The prevailing onshore air movement, usually provides for clear visibility. During periods of offshore air movement, air quality may be lowered slightly due to dust particles carried from unpaved roads and quarried areas, seasonal smoke from inland slash or grass burning, vehicular exhaust emissions, and from various other inland air pollution sources.

2. Landscape Character

Yaquina Head is one of Oregon's outstanding coastal attractions. The headland, with its century-old lighthouse and many sightseeing opportunities, is a very popular place for people to visit and enjoy. In a 1974 report entitled *Visual Resource Analysis of the Oregon Coast,* the Oregon Coastal Conservation and Development Commission described Yaquina Head as a resource having potential for exceptional coastal experiences, and a landscape of statewide and national concern.

The beauty of Yaquina Head is found within the rugged nature of its landform, the soft colors and textures of the wildflowers and grasses, the sculptural windswept forms of the trees, the variety and abundance of marine wildlife, the colors of the ever-changing sea and sky, and the traditional appeal of the lighthouse itself. Highly contrasting these scenic characteristics are the results of 60 years of surface mining. The 356-foot-high rounded peak which once dominated Yaquina Head's skyline has been reduced to a small, barren, irregularly shaped knoll. A large open pit, carved out of the headland's broad ridge, extends well below the 150 foot level. Along the southern shoreline, a significant portion of the precipitous bluff has been lowered to near sea level, and only boulder-size spoil prevents high tides from working into the area.

3. On-Site Factors

Many of the physical resources of YHONA have been man-made or man-altered. These include the two primary vestiges of man's impact on the headland, the lighthouse building and the scarred topography left from 60 years of rock quarrying activity. The access road from U.S. Highway 101 to the lighthouse, the steps down to the intertidal zone and the various utility and communication poles are secondary signs of man's influence on this area for the past 120 years.

With the exception of the manmade lighthouse, the natural resources of YHONA are its predominating attractive forces. The sea bird rookery, the intertidal zone and the outstanding photographic opportunities on and around YHONA combine with the lighthouse to make the effort of rehabilitating the quarried areas worthwhile.

C. CULTURAL RESOURCES DATA SUMMARY

1. Historical

The century-old Yaquina Head Lighthouse, constructed on the extreme western tip of the headland during the period 1872-1873, is Oregon's tallest and second oldest active lighthouse. No longer a manned light station, this automated U.S. Coast Guard facility provides major seacoast light and radiobeacon signals and is operated continuously as a necessary aid to navigation. The lighthouse is presently on Oregon's statewide inventory of historic sites and buildings and has been nominated to the National Register of Historic Places. While it has not yet been entered in the National Register, the lighthouse is currently listed as a property "eligible for inclusion." No other sites of historical significance are known to be located within YHONA boundaries.

Originally, a large three-story lighthouse keeper's residence and a barn stood near the base of the lighthouse. In 1925, the barn was moved to the east to make room for the larger of two residences that stood on the site until they were removed by the U.S. Coast Guard in 1984. The original three-story residence was replaced in 1938 by the smaller of the two residences. Both structures served as living quarters for lighthouse personnel. The round concrete water tank on the hillside east of the lighthouse was built in 1926 to store spring water for light station use.

2. Archeological

Man's history on Yaquina Head extends to aboriginal times. In 1975, Dr. David Cole of the University of Oregon's Museum of Natural History surveyed lands under U.S. Coast Guard jurisdiction at the tip of the headland and discovered two small areas containing shell midden (comprised of fire-cracked rock, clam and blue mussel shells). Such deposits represent the remains of shellfish gathered by Indians using the headland. Both sites have been disturbed to some extent by construction of the parking area and roads associated with the light station. No other archeological sites are known to be located within YHONA boundaries.

D. BIOLOGICAL RESOURCES DATA SUMMARY

1. Plant Life

Plant communities thriving on Yaquina Head are unlike the common forest-dominated communities of the Coast Range. As with other major bluffs and headlands located along Oregon's northern and central coast, Yaquina Head is covered by a complex mixture of herb- and shrub-dominated plant communities. The number of observed plant species flourishing in these communities is relatively large when compared to the small land area involved. This is primarily due to the variety of microhabitats present which have allowed the development of a unique assortment of plant associations scattered throughout the headland.

An extensive plant identification project was conducted during the summer of 1985 by Margaret B. Marshall, an SCA/BLM volunteer. The complete listing of the vascular plants found on the YHONA is provided under the title, "Plants of Yaquina Head, Oregon," as appendix C to this document. In all, the report lists 165 plants, shrubs and trees representing 46 plant families. Eight (8) other plants from the "Oregon Nature Conservancy list of 1977" were not found but are noted on the assumption that they are still present on the YHONA.

2. Plants of Special Interest

Three additional plant species found growing on Yaquina Head are considered uncommon and of special interest. These are Alaska rein orchid, seaside gold-fields and sea kale. The Alaska rein orchid is no longer listed as a "proposed endangered" species on either the Smithsonian or U.S. Fish and Wildlife Service lists, but botanists generally agree that this plant is threatened by coastal development and urbanization. It was removed from the Federal lists for taxonomic reasons only, subject to re-evaluation in the future on the basis of subsequent research. The seaside gold-fields was removed from the Smithsonian "threatened" species list, but botanists in Oregon concur that this plant is in a "sensitive" category until more conclusive surveys are completed. For this reason, seaside gold-fields remains a "sensitive" plant species on the Oregon Rare and Endangered Plant Project's updated list (May 1982). Although the sea kale, a native species of coastal Europe, is not listed as rare, threatened or endangered on any Federal or State of Oregon list, it is extremely rare in North America. For this reason, the sea kale has been placed in a "review" category by the Salem District pending the outcome of further study and research.

Although not within YHONA boundaries, benthic algal (kelp) communities which populate the intertidal zone surrounding Yaquina Head are recognized as some of the finest collecting beds available to the public along the entire Oregon coast. These kelp beds are uniquely rich in species variety and abundance. The steep beaches jutting out from the headland exemplify a great variety of marine algal types relating to a uniquely marked zonation of marine microhabitats. At least half of the possible types of marine algae found along the Oregon coast can be found in the tidal zones of the headland.

3. Animals

a. Fish

Because of the headland's lack of aquatic habitat, there are no freshwater fish populations within YHONA boundaries. However, the intertidal zone surrounding Yaquina Head, with its exceptional kelp beds, provides excellent aquatic habitat for a variety of saltwater fish species. While the species are numerous, the most common saltwater fish species known to inhabit these waters are lingcod, black rockfish, striped perch, red Irish lord, cabezon, greenling (sea trout), red tail perch and dogfish shark.

Two species of schooling fish, anchovy and coho salmon, occasionally move through the intertidal zone near shore.

b. Mammals

1) Terrestrial Mammals: Intensive use of Yaquina Head by man has brought about the elimination of large terrestrial mammals. The only terrestrial mammals known to inhabit lands within YHONA boundaries at this time are the Columbia ground squirrel, white-footed deer mouse, Yaquina shrew mole and Townsend's chipmunk.

2) Marine Mammals: Large marine mammals, including the harbor seal, sea lion and migrating California gray whale frequent near-shore areas surrounding the headland. Harbor seals and occasionally sea lions haul out on the rocks near or in the intertidal zone, while gray whales annually migrate north and south past the tip of the headland.

c. Birds

Breeding, Migrating and Wintering Birds: An undated Oregon State University Marine Science Center report on bird use of Yaquina Head, by Robert Olson, divides species into two general categories—birds breeding at Yaquina Head and birds using the headland area during periods of migration and wintering. Figure 7 lists the breeding species, and Figure 8 lists the migrating and wintering species tabulated in this report.

Figure 7—Marine Birds Breeding at Yaquina Head

Species	Abundance*	Species	Abundance*
Brant's Cormorant	C	Common Murre	N
Pelagic Cormorant	C	Pigeon Guillemot	C
Black Oystercatcher	U	Rhinoceros Auklet	U
Glaucous-winged Gull	C	Tufted Puffin	U
Western Gull	N		

Figure 8 — Birds Using the Yaquina Head Area During Periods of Migration and Wintering

Species	Abundance*	Species	Abundance*
Common Loon	C	Western Sandpiper	O
Arctic Loon	U	Red Phalarope	I
Red-throated Loon	U	Northern Phalarope	I
Red-necked Grebe	U	Parasitic Jaeger	I
Horned Grebe	C	Glaucous-winged Gull	N
Western Grebe	N	Western Gull	N
Brown Pelican	C	Herring Gull	X
Double-crested Cormorant	C	Bonaparte's Gull	C
Brant's Cormorant	C	Sabine's Gull	I
Pelagic Cormorant	C	Heerman's Gull	O
Harlequin Duck	I	Black-legged Kittiwake	O
White-winged Scoter	N	Common Tern	I
Surf Scoter	N	Arctic Tern	X
Black Scoter	C	Common Murre	N
Black Oystercatcher	U	Marbled Murrelet	O
Surfbird	C	Ancient Murrelet	I
Black Turnstone	N	Cassin's Auklet	O
Wandering Tattler	U	Rhinoceros Auklet	O
		Western Killdeer	X

*N — numerous: 50 or more birds/observer/day
C — common: 11-49 birds/observer/day
U — uncommon: 1-10 birds/observer/day
O — occasional: not seen every day, but occurs regularly
I — irregular: abundance and/or occurrence fluctuates annually
X — unknown: too little information to determine abundance

Peak bird abundance at Yaquina Head occurs during the breeding season when several thousand common murres congregate with varying numbers of the other eight marine-associated species known to utilize the rocky headland as a nesting area. The breeding season occurs from April through July. Migrating and wintering bird species may be found in the headland area practically any month of the year, depending on the particular species, although the period June through July is a low point for birds within this category. Besides the marine environment-related species listed, most of the terrestrial birds that inhabit Lincoln County may be found on portions of Yaquina Head at some time during the year, and many passerine (song) birds nest there.

Although frequency of occurrence is not known, birds of prey that have been observed at Yaquina Head are the sharp-shinned hawk, Cooper's hawk, red-tailed hawk, Swainson's hawk, rough-legged hawk, peregrine falcon, kestrel and osprey.

d. Threatened and Endangered Species

Figure 9 shows the status of threatened and endangered species known to occur in the general Yaquina Head area. The five bird species listed may occasionally use the headland as a temporary resting area during migrations along the Oregon coast. California gray whales are routinely observed just off the headland's tip and sometimes in shallow waters near the offshore rocks and islands.

Figure 9 — Status of Threatened and Endangered Species Known to Occur in the Vicinity of Yaquina Head

	Status	
	Federal	State
Peregrine Falcon	Endangered	Endangered
Brown Pelican	Endangered	Endangered
California Gray Whale	Threatened	

Most brown pelicans observed along the Oregon coast from July to November are juvenile birds dispersing from nesting areas and are the only endangered species using Yaquina Head in any numbers or for extended periods. Fifteen to twenty brown pelicans were observed loafing for several hours on the tip of the headland in late August 1983. Brown pelicans are normally seen feeding on the ocean some distance off Yaquina Head or resting in the Yaquina estuary approximately 4 miles to the south. The rocks and island within the Oregon Islands National Wildlife Refuge just of the tip of the headland may occasionally serve as night roosting sites for these endangered birds.

A single peregrine falcon was reported observed flying over Yaquina Head.

No nesting or breeding habitat for any of the threatened and endangered species listed in Figure 9 is located within YHONA boundaries.

E. GEOLOGIC FINDINGS SUMMARY

1. Purpose

The purpose of the geologic study and mapping was to describe the various geologic units exposed at the project site in sufficient detail for use in preliminary designs and estimates for proposed improvements. This included examining and determining the type of rocks and soils present along the existing and proposed road alignments, in the several quarry sites and other areas where grading is anticipated. Special note was made concerning the resistance of the rock or other materials to three types of excavation methods: blasting, ripping, and common cut and fill. Slope gradients were recommended for each of the mapped materials units.

2. Field Work

Field mapping was conducted by visual inspection on September 26, 1985, using the 1 inch equals 200 feet topographic base map dated 1980 supplied by BLM. Contacts between various strata and rock units were noted on the map using prominent topographic features, aerial mapping pre-marks as guides, and with the aid of a Brunton pocket transit. After completion of the field investigation, aerial photos were received which were used to check and adjust the map where necessary.

Large areas of the project site were covered with soils, man-made fill and vegetation, so formational contacts should be considered approximate.

3. Other Sources

Additional information concerning the engineering geology of the project area was gathered from the geotechnical report, No. 7-81, "Report of Quality and Quantity of Remaining Rock at Yaquina Head Quarry," (FHWA) Sources No. 35-21-0037, Newport, Oregon, by the Department of Transportation, Federal Highway Administration, Region 17, Vancouver, Washington, dated March 17, 1981; and, "Mineral Valuation of the Yaquina Head Quarry Located in Newport, Lincoln County, Oregon," by Donald G. Fisher, Mining Engineer - Mineral Appraiser, Denver Federal Center, BLM, (no date).

4. Materials Characteristics

a. **Basaltic Rocks** - The basaltic rocks includes dense, dark gray basalt; vesicular gray basalt; gray to brown brecciated basalt; and, altered brown to tan colored brecciated basalt zones. Excavation of most of this rock will probably require drilling and blasting except for local altered zones and/or zones with closely spaced joints. Finished slopes can stand on grades of 1/2:1 or greater where closely spaced joints or weathered zones are not present.

b. **Tuffaceous Sands** - This unit consists primarily of fine to medium-grained tuffaceous silty sand with subangular to subrounded gravel of basaltic composition. The sand is generally light tan in color, stratified and lightly cemented along bedding planes and joints. In places, the sand is loose and displays no cementation.› Commonly, medium brown colored zones are exposed near the top of the unit due to staining and the concentration of basaltic fragments. In places this unit appears to have been "baked" by an overriding basaltic flow.

These materials can be excavated with common equipment and in some places with hand tools. Although these beds were observed to stand on very steep slopes (in some places nearly vertical), cut slopes› should be designed on a 1 to 1 slope for preliminary estimating purposes.

c. **Natural Soils** - Natural soils in the project site area are generally less than 2 feet thick with a poorly developed organically enriched zone only an inch or two in thickness. Underlying the organically stained zone is a light brown sandy to gravelly loam.

d. **Man-made Fill** - Owing to the magnitude of the quarrying and road building operations in the project area, much of the surface consists of reworked materials. This material is highly variable in particle size, type of parent source and degree of compaction. In general, this unit consists of poorly graded basalt, sedimentary sand and various soils particles ranging from cobble to fine sand and silt in size. This unit can be excavated with mechanized equipment and hand tools. Embankments and cuts should be designed on a 1-1/2 to 1 slope for preliminary studies.

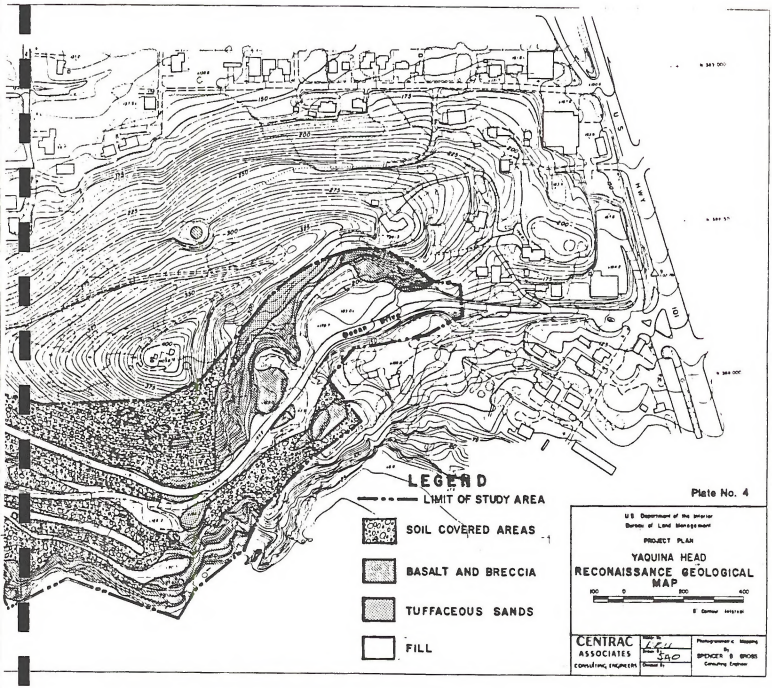
5. Unstable Areas

Two existing unstable areas were noted during field studies and are shown on the reconnaissance geologic map, (Plate No. 4). The first is located along the main road between the upper and lower quarry sites. The existing road bed is supported by man-made fill and natural materials with very steep side slopes. A detailed geotechnical study of this area is needed if this section of road is to be used in the future.

The second area is located along the north lip of the upper quarry. The north slope of this area drops over 125 feet in only 200 feet of distance. A slope stability analysis should be conducted to determine the safety factor for resistance to sliding, if public access is planned for this area.

6. Recommendations

When final or more detailed construction features are decided, road alignment drilling and testing should be initiated to accurately locate the depth, type and significant physical parameters of the overburden and rock. Where steep-sloped cuts or fills are anticipated, a detailed slope stability analysis is recommended which may require additional drilling and testing. Drilling and sampling should be accomplished in the lower quarry to determine the feasibility of removing additional material if this quarry reclamation alternative is considered viable. Consideration should be given to retaining the north wall of the lower quarry and portions of the upper quarry as examples of geologi › "nature." These exposures could be used for instruction to elementary, high school and college students.



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F. FUNCTIONAL RELATIONSHIP ANALYSIS SUMMARY

The proposed functions of the YHONA are generally well interrelated, in that, for the most part, the functions are compatible with each other with minor separations necessary in some cases. Plate No. 5, Functional Relationship Diagram, shows the relationship of the various functions. In general, the only real conflict of functions arises in the area of the old lighthouse. It is here that several of the needed functions are to be› located:

- Bird watching and photographing
- Whale watching and photographing
- Lighthouse visits and photographing
- Vehicle parking and maneuvering
- Pedestrian gathering and hiking
- Information center visits
- Tidal pool attraction visits

Over the past several years, and especially since the construction of the fence restraining people from the areas of intense bird activity, the very large numbers of birds have accepted the presence of people behind the fence. It is believed that this acceptance and co-existence can continue with properly located *and designed* facilities which will afford visitors with acceptable exposures (visual, auditory and informative).

The project plan addresses these and other functional relationships by avoiding or minimizing conflicting functions and maximizing compatible functions. For example, the parking area located between the lighthouse and the proposed interpretive center is limited in size to recognize the physical constraints of that site. This will also limit the amount of vehicle movement near the head at any one time.

FUNCTIONAL RELATIONSHIP DIAGRAMS

YAQUINA HEAD PROJECT PLAN

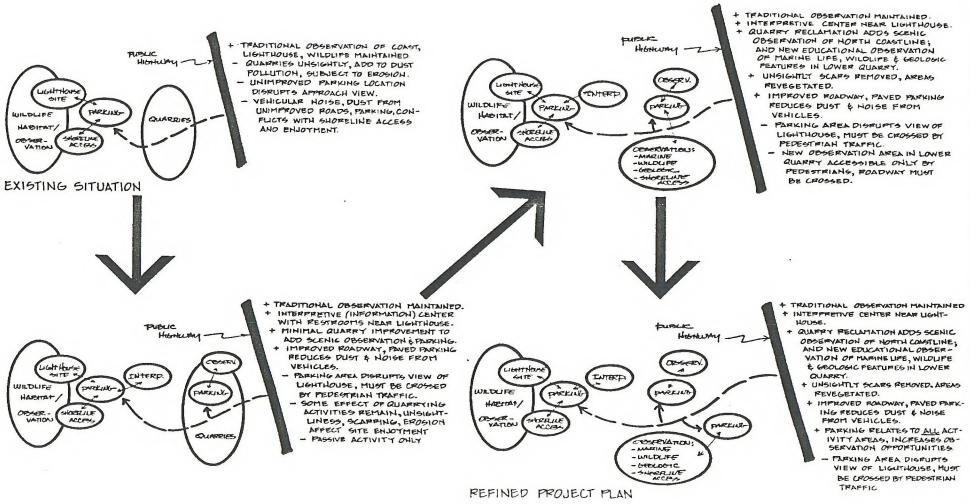

PUBLIC HIGHWAY
LIGHTHOUSE SITE
WILDLIFE HABITAT/ OBSERVATION
PARKING
SHORELINE ACCESS
QUARRIES
+ TRADITIONAL OBSERVATION OF COAST, LIGHTHOUSE, WILDLIFE MAINTAINED.
– QUARRIES UNSIGHTLY, ADD TO DUST POLLUTION, SUBJECT TO EROSION.
– UNIMPROVED PARKING LOCATION DISRUPTS APPROACH VIEW.
– VEHICULAR NOISE, DUST FROM UNIMPROVED ROADS, PARKING, CONFLICTS WITH SHORELINE ACCESS AND ENJOYMENT.
EXISTING SITUATION
ENTERED
OBSERV.
OBSERVATIONS: - MARINE - WILDLIFE - GEOLOGIC - SHORELINE ACCESS
+ TRADITIONAL OBSERVATION MAINTAINED
+ INTERPRETIVE CENTER NEAR LIGHTHOUSE.
+ QUARRY RECLAMATION ADDS SCENIC OBSERVATION OF NORTH COASTLINE, AND NEW EDUCATIONAL OBSERVATION OF MARINE LIFE, WILDLIFE & GEOLOGIC FEATURES IN LOWER QUARRY.
+ UNSIGHTLY SCARS REMOVED, AREAS REVEGETATED.
+ IMPROVED ROADWAY, PAVED PARKING REDUCES DUST & NOISE FROM VEHICLES.
– PARKING AREA DISRUPTS VIEW OF LIGHTHOUSE, MUST BE CROSSED BY PEDESTRIAN TRAFFIC.
– NEW OBSERVATION AREA IN LOWER QUARRY ACCESSIBLE ONLY BY PEDESTRIANS, ROADWAY MUST BE CROSSED.
+ TRADITIONAL OBSERVATION MAINTAINED.
+ INTERPRETIVE (INFORMATION) CENTER WITH RESTROOMS NEAR LIGHTHOUSE.
+ MINIMAL QUARRY IMPROVEMENT TO ADD SCENIC OBSERVATION & PARKING.
+ IMPROVED ROADWAY, PAVED PARKING REDUCES DUST & NOISE FROM VEHICLES.
– PARKING AREA DISRUPTS VIEW OF LIGHTHOUSE, MUST BE CROSSED BY PEDESTRIAN TRAFFIC.
– SOME EFFECT OF QUARRYING ACTIVITIES REMAIN, UNSIGHTLINESS, SCARRING, EROSION AFFECT SITE ENJOYMENT
– PASSIVE ACTIVITY ONLY
+ TRADITIONAL OBSERVATION MAINTAINED
+ INTERPRETIVE CENTER NEAR LIGHTHOUSE.
+ QUARRY RECLAMATION ADDS SCENIC OBSERVATION OF NORTH COASTLINE, AND NEW EDUCATIONAL OBSERVATION OF MARINE LIFE, WILDLIFE & GEOLOGIC FEATURES IN LOWER QUARRY.
+ UNSIGHTLY SCARS REMOVED, AREAS REVEGETATED.
+ IMPROVED ROADWAY, PAVED PARKING REDUCES DUST & NOISE FROM VEHICLES.
+ PARKING RELATES TO ALL ACTIVITY AREAS, INCREASES OBSERVATION OPPORTUNITIES
– PARKING AREA DISRUPTS VIEW OF LIGHTHOUSE, MUST BE CROSSED BY PEDESTRIAN TRAFFIC
REFINED PROJECT PLAN

PLATE NO. 5

III. Project Plan Concept and Design Parameters

The thrust of this Project Plan is two-fold; first, to develop a plan for the rehabilitation of the areas of the site disturbed by rock quarrying as specified in Public Law 96-199; second, to make sure this plan is compatible with, and provides for, the other directions of the December 27, 1983, YHONA Management Plan decision. These include: install underground utilities, pave Ocean Drive, install an entrance gate, develop paved parking areas, construct an interpretive visitor center, fence boundary, develop trails and others.

Four Project Plan concepts are presented here, including a no-action alternative.

A basic set of improvements and facilities is consistent for each of the plan concepts, with the exception of the no-action alternative. Descriptions of those improvements follow, along with variations unique to each alternative. They are illustrated by plates No. 6 through No. 9.

A. BASIC IMPROVEMENTS

1. Install Underground Utilities Along Ocean Drive

a. Telephone and other communications.
b. Electrical power.
c. Domestic water.
d. Sanitary sewage.

2. Pave Ocean Drive

Ocean Drive would be graded, brought as near as possible to BLM standards, base added and paved with plant mix asphaltic concrete. Drainage of stormwater and sedimentation basins/oil skimmers would be provided. The location of Ocean Drive would be unchanged, except near the southwest end of the upper quarry where it would be relocated northward to avoid unstable soils.

3. Install Entrance Gate

A gate will be installed to restrict the use of YHONA to the designated hours of operation. A small turnaround area will be constructed east of the gate.

4. Parking

Approximately one acre of graded, drained, paved and striped parking area would be developed at the end of Ocean Drive, east of the lighthouse area. The parking area design would be coordinated with the trail system to the observation platform. This area will accommodate approximately 100 standard size automobiles and drive areas. Provision for other vehicle types (i.e. buses, motor homes, etc.) would be necessary, which would reduce the total number of standard spaces.

At strategic locations along Ocean Drive, unpaved turnout parking areas would be graded so that people could stop to view and photograph scenery, birds/animals, etc.

5. Interpretive Center

An enclosed visitor facility would be constructed adjacent to the parking area at the tip of the headland. The center would be slightly elevated above and east of the parking area. This would increase visitor observation opportunities and avoid significant earthmoving/hillside disruption. The center would be designed in an architectural style which would complement the lighthouse and the observation platform and would be sized to accommodate 100 persons per hour during peak use periods. Restroom facilities would be provided and a pump/lift station would pump sewage back to the nearest sewer line at U.S. Highway 101.

6. Boundary Fencing

The north and east boundaries of the site would be monumented and fenced to prevent unwanted access to the site by off-road vehicles, dogs and improper pedestrian traffic. An entrance gate would be installed at the east boundary of the site on Ocean Drive. Appropriate regulatory signing would be installed along the fence and at the entrance.

7. Pedestrian Trails

Graded pedestrian paths would be developed to provide access to photography vista points and fishing areas.

The stairway to the intertidal area on the south side of the YHONA would be extended to a lower elevation to provide additional visitor safety.

B. ALTERNATIVE I — CONCEPTUAL MASTER PLAN FOR NATURAL RECLAMATION (Plate No. 6)

An alternative to take no rehabilitation action and allow natural reclamation to rehabilitate the site will be a part of the environmental assessment. The wildlife observation platform west of the lighthouse would be the only facility improvement under this "no action" program. However, this alternative does not provide for the rehabilitation of the site mandated by the legislation creating the Yaquina Head Outstanding Natural Area.

C. ALTERNATIVE II — CONCEPTUAL MASTER PLAN FOR MINIMUM RECLAMATION EFFORT TO CONFORM WITH LEGISLATION (Plate No. 7)

1. Reshape Disturbed Areas

All surface areas disturbed by quarrying activity would be regraded to fill holes, flatten slopes, and generally smooth out the disturbed areas. These areas would be planted with native shrubs and grasses to retard erosion and to accelerate the revegetation process.

2. Secondary Parking

A secondary parking area would also be developed in the upper quarry to provide overflow parking for the interpretive center and convenient parking for the upper area activities such as photography, hiking and sightseeing. This area should also be designed to accommodate about 100 vehicles. On days of maximum visitor usage, shuttle buses might be used to transfer visitors to and from the interpretive center at the lighthouse area.

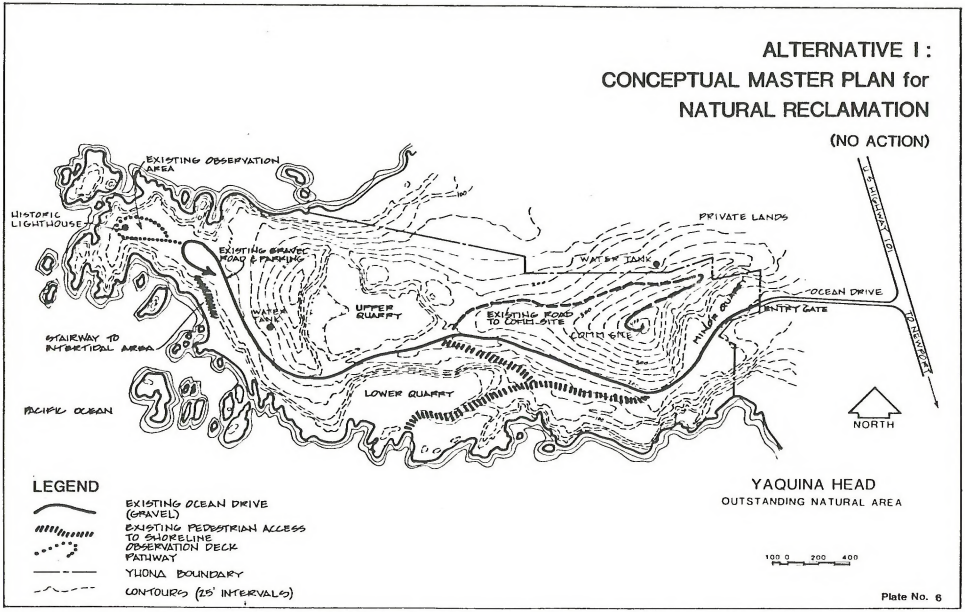
D. ALTERNATIVE III — CONCEPTUAL MASTER PLAN FOR RECLAMATION ENHANCEMENT (Plate No. 8)

In addition to the basic improvements described above, Alternative III provides for the following:

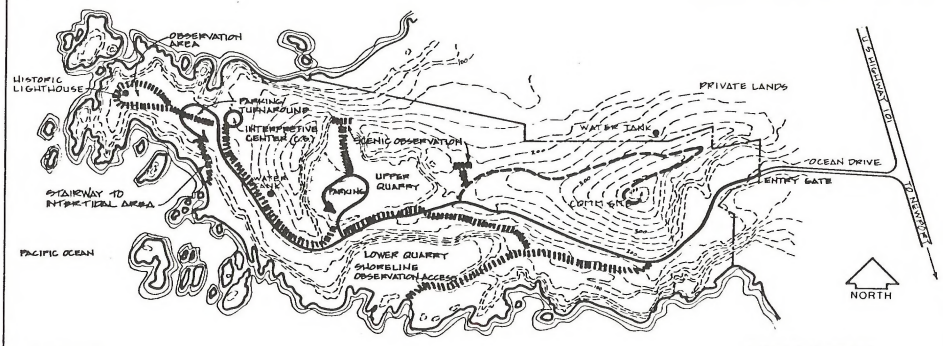
1. Reclaim Disturbed Area

A major effort would be made to reclaim and restore as much disturbed area as possible to aid the natural process of reclamation and revegetation.

At the entrance to the YHONA and along Ocean Drive, the disturbed slopes would be altered to conform with surrounding natural slopes, low areas would be graded for drainage and native vegetation would be seeded or planted to accelerate the revegetation/ground-cover process.


ALTERNATIVE I :
CONCEPTUAL MASTER PLAN for
NATURAL RECLAMATION
(NO ACTION)
EXISTING OBSERVATION AREA
HISTORIC LIGHTHOUSE
EXISTING GRAVEL ROAD & PARKING
PRIVATE LANDS
WATER TANK
U.S. HIGHWAY 101
OCEAN DRIVE
ENTRY GATE
TO NEWPORT
UPPER QUARRY
WATER TANK
EXISTING ROAD TO COMM. SITE
COMM. SITE
MINOR GULCH
STAIRWAY TO INTERTIDAL AREA
PACIFIC OCEAN
LOWER QUARRY
NORTH
LEGEND
EXISTING OCEAN DRIVE (GRAVEL)
EXISTING PEDESTRIAN ACCESS TO SHORELINE OBSERVATION DECK PATHWAY
YHONA BOUNDARY
CONTOURS (25' INTERVALS)
YAQUINA HEAD
OUTSTANDING NATURAL AREA
100 0 200 400
Plate No. 6

ALTERNATIVE II :
CONCEPTUAL MASTER PLAN for
MINIMUM RECLAMATION



LEGEND

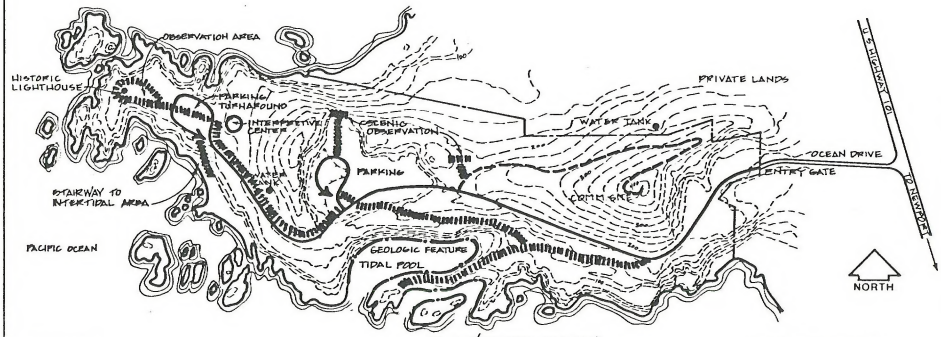
- IMPROVED ROADWAY, TURNOUT & PARKING AREAS
- PEDESTRIAN ACCESS/PATHWAYS
- EXISTING ROAD TO COMM. SITE
- INTERPRETIVE CENTER W/ REST ROOMS
- YHONA BOUNDARY
- CONTOURS (25' INTERVALS)

YAQUINA HEAD
OUTSTANDING NATURAL AREA

100 0 200 400

Plate No. 7

ALTERNATIVE III :
CONCEPTUAL MASTER PLAN for
RECLAMATION ENHANCEMENT



LEGEND

- IMPROVED ROADWAY, TURNOUT & PARKING AREAS
- PEDESTRIAN ACCESS/PATHWAYS
- EXISTING ROAD TO COMM. SITE
- RESHAPED SHORELINE TO ENHANCE EDUCATIONAL OBSERVATION
- INTERPRETIVE CENTER W/ REST ROOMS.
- YHONA BOUNDARY
- CONTOUR (25' INTERVALS)

YAQUINA HEAD
OUTSTANDING NATURAL AREA

100 0 200 400

Plate No. 8

In the area of the upper quarry, the jagged knobs which are remnants of the original ridgeline would be rounded and slightly lowered to present a smoother and more naturally appearing skyline. The material gained would be used to flatten the northern and eastern slopes/walls of the upper quarry. Little would be done to the western wall as it supports the west-sloping hill that provides the natural backdrop for the lighthouse area. It visually separates the tip of the head from the quarry and is not significantly different from what might occur in nature. Some revegetation of the wall has already begun and any substantial improvement would be very costly.

Over the years of quarrying, large amounts of overburden have been allowed to spill down the hill north of the upper quarry, presenting a messy appearance and an unstable slope. This material would be dragged back up to the quarry to trim and flatten the north facing hillside and vegetation would be planted to control erosion and help stabilize the steep slopes.

In the area between the upper and lower quarries, the topsoil and underlying soils above approximately 100 foot elevation would be laid back on more stable slopes and planted. This would allow the concealment of the highly visible layer of light colored soil above the basalt wall and gain fill material for the upper quarry area. The "levee" upon which Ocean Drive is currently located would be lowered, with more natural appearing slopes extending from one quarry to the other. Ocean Drive would be relocated along the southern edge of the› upper quarry.

The lower quarry bottom would be quarried down to an irregular surface from approximately five feet above low tide to ten feet below low tide. The large pile of boulders at the southwest end of the quarry would be removed. Additionally, a rock island would be created from the high ground just south of the existing lower quarry haul road. Income from this additional quarrying activity would be used to offset the costs of construction. Approximately 200,000 cubic yards of basalt would be quarried generating an estimated $150,000 in revenue to be used in reclamation. These actions would create the following academic/scientific field research facilities:

a. An intertidal area which researchers could observe to monitor the initiation and development of marine life.

b. A rock cliff approximately 100 feet high which could be used by elementary, high school and college geology students to study geologic features which are exposed in the cliff.

2. Relocate and Improve Ocean Drive

The horizontal and vertical alignment of Ocean Drive would be improved, the road would be regraded to BLM standards where possible and base and paving would be installed to make a safer and more comfortable driving surface.

A drainage system would be designed to collect, skim and desediment stormwater prior to its discharge to the sea. Where possible, detention basins would be built into the landscape to slow the rate of discharge so erosion and sedimentation would be minimized.

Ocean Drive would be realigned along the upper quarry area in conjunction with the regrading of the inter-quarry area described above. This would enable the construction of convenient overflow parking for the interpretive center, sightseers and other users of the YHONA.

3. Secondary parking

A secondary parking area would be developed in the upper quarry to provide overflow parking for the interpretive center and convenient parking for the upper area activities such as photography. hiking and sightseeing. This area should also be designed to accommodate about 100 vehicles. On days of maximum visitor usage, shuttle buses might be used to transfer visitors to and from the interpretive center at the lighthouse area.

4. Pedestrian Trails

Graded and paved pedestrian paths would be developed to provided access to photography vista points, fishing areas and sightseeing areas. A paved walkway would be constructed alongside Ocean Drive from the parking area in the rehabilitated upper quarry to the lighthouse/interpretive center area.

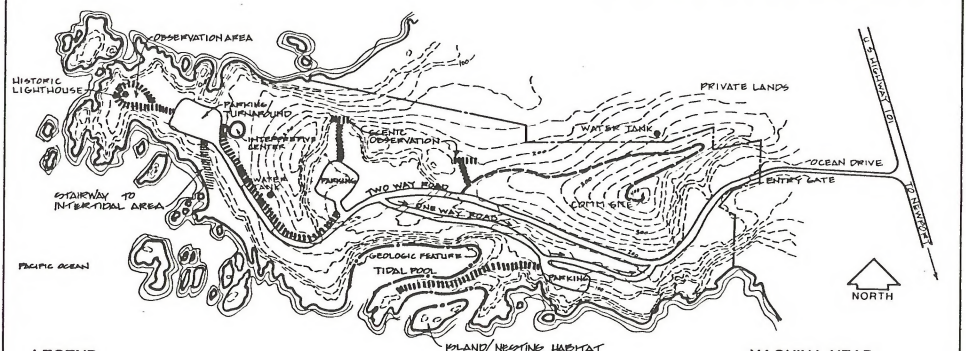
E. ALTERNATIVE IV — REFINED CONCEPTUAL MASTER PLAN: INTRODUCTION OF MAN TO NATURE (Plate No. 9)

In addition to the basic improvements described earlier, the restoration, reclamation and revegetation effort of Alternative III would be the same in this alternative.

Alternative III would be enhanced in this alternate by the provision of a one-way road loop and parking area to provide convenient access to the reclaimed lower quarry. As shown on Plate No. 9, this new access road would connect with Ocean Drive near the upper quarry and descend along the route of a present haul road to a linear parking area above the lower quarry and fishing area, which would accommodate 40-50 vehicles. The road back up the slope would connect to Ocean Drive about one-third of the distance back to the entrance to YHONA. Introduction and direction to the marine/geology study area would be by pamphlets and programs given out at the interpretive center.

Pedestrian access to the newly created intertidal area, the geologic features and the new island rookery would be via the existing lower quarry haul road. This alternative dramatically changes the visitor opportunities from observing the lighthouse, wildlife, whale migration, and bird nesting areas to involving many more people in the learning experience from within and without the scientific community.

ALTERNATIVE IV : REFINED CONCEPTUAL MASTER PLAN – INTRODUCTION OF MAN TO NATURE



LEGEND

- IMPROVED ROADWAY, TURNOUT & PARKING AREAS
- PEDESTRIAN ACCESS/ PATHWAYS
- RESHAPED SHORELINE TO ENHANCE EDUCATIONAL OBSERVATION
- ROADWAY TO COMM. SITE
- INTERPRETIVE CENTER W/ REST ROOMS
- YHONA BOUNDARY
- CONTOURS (25' INTERVALS)

YAQUINA HEAD
OUTSTANDING NATURAL AREA

100 0 200 400

Plate No. 9

F. SELECTED ALTERNATIVE

Alternative IV is selected as the Proposed Action.

The action is based on a firm conviction that this alternative would:

1. Best fulfill the objectives of the YHONA legislation.
2. Improve man's involvement in and appreciation of YHONA, not "just" restore it.
3. Create a valuable academic facility.
4. Maximize the diversity of public use and enjoyment of YHONA.

Comment:

The selected alternative is somewhat in disagreement with *Issue 3 — Vehicular access and parking* as described in the Recreation Area Management Plan published by BLM in September 1985. That section states a Management Action which would restrict or close all roads except Ocean Drive.

It is recommended that this issue be re-examined in light of the potential of Alternative IV.

IV. Project Development Overview

A. REQUIRED ADMINISTRATIVE ACTIONS

Implementation of the proposed action will involve the following administrative actions:

1. Public informational output meeting (held February 12, 1986).
2. Re-examine and modify Issue 3 — Vehicular access and parking in the Recreation Area Management Plan.
3. Conduct survey and design of needed facilities.
4. Establish budget for construction, operation and maintenance.

B. REQUIRED INTERIM USE SUPERVISION

The present level of supervison provides minimal visitor contact, information and security against vandalism. As additional facilities are developed, such as the wildlife observation platform, more protection from vandalism will be required as well as maintenance due to increased visitor use. For these reasons, staffing and related budget support must be established which will allow supervision of the YHONA during all hours of operation.

It will also be necessary to install an entrance gate so that access to the site can be limited to hours of operation.

C. PROJECT DEVELOPMENT PHASING OUTLINE

1. Install boundary fence and entrance gate, and construct turnaround.
2. Select consultant to survey and design improvements.
3. Rehabilitate and revegetate scarred areas around entrance.
4. Excavate lower quarry to design depth for revenue and reclamation.
5. Rehabilitate and revegetate upper quarry and relocate Ocean Drive.
6. First phase, major facilities construction, including:

    a. Install underground utilities.
    b. Grade and gravel Ocean drive/develop roadside parking turnouts.
    c. Construct parking area near lighthouse.
    d. Construct interpretive center.
    e. Extend stairs down to intertidal zone level.

7. Second phase, major facilities construction, including:

    a. Construct additional parking in upper quarry.
    b. Construct road and parking area for lower quarry educational facility and fishing area.
    c. Pave Ocean Drive and parking areas.

D. PROJECT DEVELOPMENT SCHEDULE OUTLINE

1.	Install entrance gate.	FY 86
2.	Fence YHONA boundary.	FY 87
3.	Survey and design improvements.	FY 87
4.	Rehabilitate entrance area.	FY 88
5.	Excavate lower quarry.	FY 88
6.	Rehabilitate upper quarry and grade Ocean Drive.	FY 88
7.	First phase construction	FY 89
8.	Second phase construction.	FY 90

E. METHOD OF PROJECT SURVEY AND DESIGN

An architectural/engineering/planning consultant will be retained to survey and design the finished product with close BLM supervision and review. The consultant should be one which has in-house professionals in required disciplines of architectural and engineering design so that ideas and concepts will not be lost in communication. Field surveying and landscape architecture can be provided by qualified subconsultants.

V. Environmental Assessment (OR-080-6-10)

A. INTRODUCTION—

Background information for the Yaquina Head Outstanding Natural Area (YHONA) Environmental Assessment (OR-080-6-10) is provided in Sections I, II, III, and IV of this document. All references to figures, plates, appendices are also to those contained in this document.

B. ALTERNATIVES INCLUDING THE PROPOSED ACTION

Four alternatives are analyzed in this environmental assessment. These include a Proposed Action and three alternatives. Inasmuch as detailed descriptions of the four alternatives are presented in Section III, Project Plan, earlier in this document, only a summary of each is included here. Cost estimates for implementing each of the alternatives are presented in Section VI, Implementation Cost Estimates.

C. ALTERNATIVES SUMMARY

1. The Proposed Action — Introduction of Man to Nature (Plate No. 9)

This alternative expands the use of YHONA from a recreational site to visit and passively enjoy by viewing, to include the lower quarry area as a major educational and research laboratory. It would continue to serve the visiting public as a place to go to observe birds, photograph the lighthouse, observe whales, etc.; and the facilities for access, parking and utilities would be improved for reasons of visitor safety and convenience.

The lower quarry area would be deepened and revenue would be generated to offset other rehabilitation efforts. The resulting basin would become an intertidal area and could be observed by the academic/scientific community as it is transformed from a sterile rock basin into a living marine laboratory. Similarly, the rock face which forms the northern wall of the lower quarry has some interesting geologic features which will be valuable teaching tools to elementary, high school, and college students.

Visitor access to the lower quarry would be provided by constructing a one-way road and a parking area. The system would use existing haul roads and construction cuts where possible. The loop would begin near the upper quarry parking area and descend to a terrace cut at the 120-foot elevation where parking for 40-50 automobiles could be provided. The loop would return to Ocean Drive at the curve below the communications site. Access from parking to the intertidal area would be by use of the existing haul road which would be groomed and maintained only for pedestrian traffic.

An interpretive center would be constructed east of and at a higher elevation than the existing parking area near the lighthouse. That parking area would be improved to accommodate approximately 100 vehicles and an overflow parking area would be constructed in the upper quarry. Ocean Drive would be regraded, widened and paved from its intersection with U.S. Highway 101 to the parking area at the head. Underground utilities would be installed along Ocean Drive.

2. Alternative I — Natural Reclamation (Plate No. 6)

This alternative is essentially a "No-Action" alternative, involving only patch-job grading of extreme quarry slopes to eliminate hazards and allow natural processes of slope ravelling and revegetation to occur.

3. Alternative II — Minimum Effort to Conform with Legislation (Plate No. 7)

This alternative would minimally conform with the goals of the legislation creating YHONA. Limited grading would reshape disturbed areas and stabilize eroding slope faces. All exposed areas would be revegetated.

The basic improvements and facilities described in Section III. A. would be implemented.

4. Alternative III — Reclamation Enhancement (Plate No. 8)

This alternative builds on Alternative II to expand the potential enjoyment of YHONA by the creation of the intertidal area and island. This would provide an environment for the scientific/ academic community to study the establishment and evolution of an intertidal area. Revenue generated through the excavation of the intertidal area and creation of the island would help defray the costs of rehabilitating the site.

D. ENVIRONMENTAL CONSEQUENCES

Prior to establishment of the YHONA, impacts resulting from human use of the area were generally adverse to its unique scenic, scientific, educational and recreational values, as recognized in Public Law 96-199. Left unmanaged, these uses would have continued to reduce, and in some cases eliminate, many of the YHONA's unique values. The passage of Public Law 96-199 directed the acquisition of all private land within the boundaries of YHONA, including the rock quarry operation which was the single most noticeable negative effect of man's occupation of Yaquina Head. Public Law 96-199 also mandated the preparation of a project plan for the rehabilitation of the quarried and damaged areas.

1. Physiography and Landscape Character

Under the Proposed Action and other alternatives, the natural character, open space and scenic quality of Yaquina Head would be maintained at various levels. The least amount of change to the existing landscape character would occur under Alternative I with the greatest change under Alternative IV, the Proposed Action. The Proposed Action would be most beneficial to scenic values since it would involve the greatest amount of effort to ameliorate the 60 years of degradation caused by the quarrying activity.

Alternative I, would provide little immediately noticeable effect. Minimal regrading and landscaping would be implemented, merely to aid the natural healing and revegetating process.

Under Alternatives II, III and IV, the Proposed Action, the following improvements would be the same:

a. Install underground utilities.
b. Grade and pave Ocean Drive.
c. Install entrance gate.
d. Construct parking area near lighthouse.
e. Construct interpretive center.
f. Fence property boundary.
g. Develop pedestrian trails.
h. Construct parking area in upper quarry.

The effects of these actions differ with respect to the amount of excavation and earthmoving which would be done under each alternative.

Under Alternative II, the disturbed areas would be regraded to less severe slopes, revegetation would be started by planting and unstable areas under Ocean Drive would be improved. The overall heights of slopes would not be changed and would still appear somewhat unnatural, even after revegetation because they would be steeper and have more abrupt changes of slope than naturally occurring slopes.

Under Alternative III and the Proposed Action, more effort would be made to re-conform all of the damaged area to a natural-appearing land mass. This will involve substantially more movement of material, reduce the height of vestige hilltops and reduce the steepness of slopes for more stability. In addition, the lower quarry improvement would require controlled excavation to create the intertidal area and island rookery. Vehicular access would be provided to that feature only in Alternative IV.

In all Alternatives, slopes will be left in more stable and attractive conditions than currently exist and the amount of vegetative cover would be increased by planting.

Under all Alternatives, the stability, safety and appearance of the entire headland will be improved by making the physiography and landscape character more natural. The effects of each Alternative vary with Alternative I having very little positive effect and the Proposed Action having the most positive effect. There should be no significant negative effects from any of the Alternatives.

2. Plants

The effects on the existing plant community would generally be the same for all alternatives. The degree of proposed revegetation varies but all alternatives would have a positive effect on the botanical environment, since plantings of indigenous species would be made.

The number of people coming to the YHONA will be approximately of the same magnitude in all alternatives. Visitor movement will be restricted to certain areas during the revegetation in order to allow proper establishment of the grasses and plants, and later to avoid demage to all areas not designated for use by visitors.

No significant negative effects to the YHONA plant community have been identified which could be related to reclamation of the YHONA under any Alternative.

There are three plant species of special interest at the YHONA (see Section II.D.2, Plants of Special Interest). None of these are threatened or endangered. Therefore, there will be no effect to threatened or endangered species by the Alternatives, although the increasing public presence at the YHONA may have an effect on the entire plant community and the plants of special interest.

3. Animals

a. Fish

None of the alternatives, including the Proposed Action, would be expected to significantly impact the ocean fishery, although the Proposed Action will create an intertidal basin which new plant and animal communities are expected to inhabit.

b. Birds and Mammals

Yaquina Head provides a unique opportunity along the Oregon coast for the public to view marine birds and mammals at close range (20 to 100 feet). Unfortunately, even this human activity in proximity to the nesting and resting animals can cause disturbances. The birds are particularly sensitive to unfamiliar noises, shadows and movements. Disturbing them during the breeding season can disrupt courtship activities, expose eggs and young to predation and reduce use of important habitat.

Crucial nesting and resting habitat for birds and mammals in the vicinity of Yaquina Head has become increasingly restricted to the most remote areas, severely reducing animal numbers. Tufted puffins have ceased nesting on the headland in the last few years because of loss of habitat. Harbor seals haul-out only on a few of the adjacent offshore islands, avoiding other areas because of human disturbance.

The installation of fencing and construction of the wildlife observation platform at the lighthouse will help to restrict the threat of human disturbance of bird nesting at the head. The interpretive center will provide visitors with information for proper observation and respect for the creatures' environment. The presence of staff and signage in the area would also maintain the necessary control of visitor activity that might otherwise negatively impact the habitats.

A significant feature is proposed in Alternatives III and IV by the creation of the island at the south shore of the lower quarry. The island will provide an opportunity to observe the extent of nesting activity and use by sea mammals in close proximity (approximately 100 feet) and at essentially eye level for the visitor.

It is hoped that marine birds will establish a nesting and resting area on this man-made island, feeling safe from humans because of the ocean separation.

Overall impacts to animals under the Proposed Action and other alternatives would be moderately beneficial. Restricting visitor access to designated walking trails would allow some reoccupation of important habitat.

No significant negative effects can be related to any of the Alternatives. However, the positive effects vary directly with the amount of effort; that is, Alternative II will have more positive effect than Alternative I; Alternative III will have more than Alternative II; and the Proposed Action will have the most positive effects.

c. Threatened and Endangered Species

There has been no confirmation of the use of YHONA as a habitat by any threatened or endangered species. Some have been sighted at YHONA (See Figure 9) but were observed only during migrations. None of the alternatives would have any negative impact on threatened or endangered species.

4. Cultural Resources

a. Historical

Under the Proposed Action and all alternatives, the 1872 lighthouse tower, determined eligible for the National Register of Historic Places, would be preserved. No other historic structure or place is known to exist at the YHONA.

b. Archeological

An investigation of the tip of the headland will be conducted prior to design of the visitor's center and parking lot to determine the location, extent and archeological value of the two small areas of shell midden discussed earlier in Section II. B. 2. At this time, it appears that the visitor's center construction will have no effect on the shell midden. The parking area may have to be carefully sited and shaped to avoid damage to the small areas of midden. With that investigation, proper design and protection, none of the Alternatives, including the Proposed Action, would be expected to significantly impact archeological values on the headland.

5. Recreation Resources

People visit the YHONA for several very different reasons (see Section II.A.1., Recreation Activity Preferences). The level of visitations is expected to significantly increase over the next several years, resulting in somewhat of a paradox: as more and more people visit the YHONA, it will become increasingly crowded and, therefore, more difficult to enjoy the activities for which they came.

The Proposed Action and Alternatives II and III will make it more convenient and safe for larger numbers of visitors to enjoy the YHONA because of the improved road, more and improved parking, an interpretive center, and other improvements. However, there will come a time when the visitor carrying capacity of the YHONA will be reached and some adjustment, improvement or regulation will be needed to avoid adversely affecting the YHONA and its sometimes fragile components. That is an issue separate from the evaluation of the relcamation alternatives.

By making the YHONA better able to accept growing numbers of visitors through the construction/ improvement of facilities, Alternatives II, III and IV all have positive effects on the recreational resources of YHONA. The reclamation/improvement itself will have no significant negative effects.

VI. Project Cost Estimate

Implementation cost estimates for the Proposed Action and other Alternatives are presented below. All estimates are based on 1986 labor, materials and equipment costs. Cost estimates for administrative actions such as management planning, entering into cooperative agreements, site supervision and monitoring are not included.

A. BASIS OF ESTIMATE

The estimate of construction costs were obtained using the following sources:

1. Mean's Site Work Cost Data 1985
2. Previous BLM estimates
3. Oregon Department of Transportation bid summaries
4. Previous projects of Centrac Associates, Inc.
5. Quotations from commercial operators

All estimates are expressed in 1986 costs without adjustment for inflation.

B. ALTERNATIVE I

Inasmuch as few improvements or facilities beyond the wildlife observation platform are proposed, this no-action alternative would consist of little capital expenditure, only for maintenance of the status quo. Remedial action may occasionally be required to eliminate hazards created through natural processes. Anticipated construction costs are estimated as follows:

		Est. Cost (000's)	FY 86	FY 87	FY 88	FY 89	FY 90
1.	Barricade spur roads	12		X			
2.	Install boundary fence 4,000 L.F. 5' C.L. @ $10	40		X			
3.	Rehabilitate entrance area (L.S.)	22		X			
	TOTAL COSTS	**$74**	**12**	**62**	**0**	**0**	**0**

C. ALTERNATIVE II

		Est. Cost (000's)	FY 86	FY 87	FY 88	FY 89	FY 90
1.	Barricade spur roads	12	X				
2.	Install boundary fence 4,000 L.F. 5' C.L. @ $10	40		X			
3.	Survey and design improvements (16% of construction cost)	259		X			
4.	Rehabilitate entrance area (L.S.)	22			X		
5.	Major earthwork						
	a. Regrade site, slopes and quarries 100,000 CY @ 1.50 CY	150			X		
	b. Grade, drain & base Ocean Drive 5400 LF @ $35 /LF	189			X		
	c. Planting	25			X		
6.	Major facility construction						
	a. Install underground utilities						
	i. Install water supply 6" PVC, 5400 LF @ $15/LF	81				X	
	ii. Install sewage pump (L.S.)	60				X	
	iii. Install 4" flexible sewer line, 5400 LF @ $15/LF	81				X	
	iv. Install telephone line 5400 LF @ $5/LF	27				X	
	v. Install underground electric power 5400 LF @ $8/LF	43				X	
	b. Construct 100 space parking area 5,000 SY @ $10.50/SY	53					X
	c. Construct 10,000 SF interpretive building @ $50/SF	500					X
	d. Extend stairs to tidal pool level L.S.	5		X			
	e. Construct 100 space parking area in upper quarry 5,000 SY @ $10.50 SY	53					X
	f. Construct drainage control system	50					X
	g. Pave Ocean Drive and turnouts	143					X
	h. Planting	50					X
	i. Construct 2400 LF new pedestrian path @$9.50/ LF	23					X
	j. Improve haul roads for pedestrian access - 2500 LF @ $4/LF	10					X
	TOTAL COSTS	**$1,876**	**12**	**304**	**386**	**292**	**882**

D. ALTERNATIVE III

		Est. Cost (000's)	FY 86	FY 87	FY 88	FY 89	FY 90
1.	Barricade spur roads	12	X				
2.	Install boundary fence 4,000 L.F. 5' C.L. @ $10	40		X			
3.	Survey and design improvements (16% of construction cost)	318		X			
4.	Rehabilitate entrance area (L.S.)	22			X		
5.	Excavate lower quarry (income)	(150)			X		
6.	Major earthwork						
	a. Rehabilitate site, slopes and quarries 300,000 CY @ 1.50 CY	450			X		
	b. Grade, drain & base Ocean Drive 5400 LF @ $35 /LF	189			X		
	c. Planting	25			X		
7.	Major facility construction						
	a. Install underground utilities						
	i. Install water supply 6" PVC, 5400 LF @ $15/LF	81				X	
	ii. Install sewage pump (L.S.)	60				X	
	iii. Install 4" flexible sewer line, 5400 LF @ $15/LF	81				X	
	iv. Install telephone line 5400 LF @ $5/LF	27				X	
	v. Install underground electric power 5400 LF @ $8/LF	43				X	
	b. Construct 100 space parking area 5,000 SY @ $10.50/SY	53					X
	c. Construct 10,000 SF interpretive building @ $50/SF	500					X
	d. Extend stairs to tidal pool level L.S.	5		X			
	e. Construct 100 space parking area in upper quarry 5,000 SY @ $10.50 SY	53					X
	f. Construct drainage control system	50					X
	g. Pave Ocean Drive and turnouts	143					X
	h. Planting	100					X
	i. Construct 1900 LF pedestrian path @ $9.50/LF	18					X
	j. Improve haul roads for pedestrian access — 2800 LF @ $4/LF	11					X
	TOTAL COSTS	**$2,306**	**12**	**363**	**711**	**292**	**928**
	REVENUE	(150)	0	0	(150)	0	0
	BALANCE	**$2,156**	**12**	**363**	**561**	**292**	**928**

E. ALTERNATIVE IV — PROPOSED ACTION

		Est. Cost (000's)	FY 86	FY 87	FY 88	FY 89	FY 90
1.	Barricade spur roads	12	X				
2.	Install boundary fence 4,000 L.F. 5′ C.L. @ $10	40		X			
3.	Survey and design improvements (16% of construction cost)	344		X			
4.	Rehabilitate entrance area (L.S.)	22			X		
5.	Excavate lower quarry (income)	(150)			X		
6.	Major earthwork						
	a. Regrade site, slopes and quarries 350,000 CY @ 1.50 CY	525			X		
	b. Grade, drain & base Ocean Drive 5400 LF @ $35 /LF	189			X		
	c. Planting	50			X		
7.	Major facility construction						
	a. Install underground utilities						
	i. Install water supply 6″ PVC, 5400 LF @ $15/LF	81				X	
	ii. Install sewage pump (L.S.)	60				X	
	iii. Install 4″ flexible sewer line, 5400 LF @ $15/LF	81				X	
	iv. Install telephone line 5400 LF @ $5/LF	27				X	
	v. Install underground electric power 5400 LF @ $8/LF	43				X	
	b. Construct 100 space parking area 5,000 SY @ $10.50/SY	53					X
	c. Construct 10,000 SF interpretive building @ $50/SF	500					X
	d. Extend stairs to tidal pool level L.S.	5		X			
8.	Complete construction						
	a. Construct 100 space parking area in upper quarry 5,000 SY @ $10.50 SY	53					X
	b. Construct road loop to lower parking area 1,700 LF @ $30/LF	51					X
	c. Construct 45 space parking area above lower quarry 2,500 SY @ $6.75	17					X
	d. Construct drainage control system	50					X
	e. Pave Ocean Drive and turnouts	143					X
	f. Planting	125					X
	g. Construct 1900 LF pedestrian path @ $9.50/LF	18					X
	h. Improve haul roads for pedestrian access — 1000 LF @ $4/LF	4					X
	TOTAL COSTS	**$2,493**	**12**	**389**	**786**	**292**	**1014**
	REVENUE	(150)	0	0	(150)	0	0
	BALANCE	**$2,343**	**12**	**389**	**636**	**292**	**1014**

Appendices

Appendix A

Public Law 96-199
96th Congress

An Act

To establish the Channel Islands National Park, and for other purposes.

Mar. 5, 1980
[H.R. 3757]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

National Parks and Recreation Act of 1978, amendment

TITLE I

Sections 101 through 118, 120 and 121, and all of Title II do not relate to the Yaquina Head Outstanding Natural Area and are not included here.

Yaquina Head Outstanding Natural Area, Oreg., establishment
43 USC 1783

SEC. 119. (a) In order to protect the unique scenic, scientific, educational, and recreational values of certain lands in and around Yaquina Head, in Lincoln County, Oregon, there is hereby established, subject to valid existing rights, the Yaquina Head Outstanding Natural Area (hereinafter referred to as the "area"). The boundaries of the area are those shown on the map entitled "Yaquina Head Area", dated July 1979, which shall be on file and available for public inspection in the Office of the Director, Bureau of Land Management, United States Department of the Interior, and the State Office of the Bureau of Land Management in the State of Oregon.

Administration

(b)(1) The Secretary of the Interior (hereinafter referred to as the "Secretary") shall administer the Yaquina Head Outstanding Natural Area in accordance with the laws and regulations applicable to the public lands as defined in section 103(e) of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1702), in such a manner as will best provide for—

(A) the conservation and development of the scenic, natural, and historic values of the area;

(B) the continued use of the area for purposes of education, scientific study, and public recreation which do not substantially impair the purposes for which the area is established; and

(C) protection of the wildlife habitat of the area.

Management plan, development

(2) The Secretary shall develop a management plan for the area which accomplishes the purposes and is consistent with the provisions of this section. This plan shall be developed in accordance with the provisions of section 202 of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1712).

Quarrying of materials, permits and contracts

(3) Notwithstanding any other provision of this section, the Secretary is authorized to issue permits or to contract for the quarrying of materials from the area in accordance with the management plan for the area on condition that the lands be reclaimed and restored to the satisfaction of the Secretary. Such authorization to quarry shall require payment of fair market value for the materials to be quarried, as established by the Secretary, and shall also include any terms and conditions which the Secretary determines necessary to protect the values of such quarry lands for purposes of this section.

Reservation of lands for lighthouse purposes, revocation

(c) The reservation of lands for lighthouse purposes made by Executive order of June 8, 1866, of certain lands totaling approximately 18.1 acres, as depicted on the map referred to in subsection 119(a), is hereby revoked. The lands referred to in subsection 119(a) are hereby restored to the status of public lands as defined in section 103(e) of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1702), and shall be administered in accordance with the management plan for the area developed pursuant to subsection 119(b), except that such lands are hereby withdrawn from settlement, sale, location, or entry, under the public land laws, including the mining laws (30 U.S.C., ch. 2), leasing under the mineral leasing laws (30 U.S.C. 181 et seq.), and disposals under the Materials Act of July 31, 1947, as amended (30 U.S.C. 601, 602).

39 USC 21 *et seq*

(d) The Secretary shall, as soon as possible but in no event later than twenty-four months following the date of the enactment of this section, acquire by purchase, exchange, donation, or condemnation all or any part of the lands and waters and interests in lands and waters within the area referred to in subsection 119(a) which are not in Federal ownership except that State land shall not be acquired by purchase or condemnation. Any lands or interests acquired by the Secretary pursuant to this section shall become public lands as defined in the Federal Land Policy and Management Act of 1976, as amended. Upon acquisition by the United States, such lands are automatically withdrawn under the provisions of subsection 119(c) except that lands affected by quarrying operations in the area shall be subject to disposals under the Materials Act of July 31, 1947, as amended (30 U.S.C. 601, 602). Any lands acquired pursuant to this subsection shall be administered in accordance with the management plan for the area developed pursuant to subsection 119(b).

43 USC 1702

Administration

Wind energy research, study

(e) The Secretary is authorized to conduct a study relating to the use of lands in the area for purposes of wind energy research. If the Secretary determines after such study that the conduct of wind energy research activity will not substantially impair the values of the lands in the area for purposes of this section, the Secretary is further authorized to issue permits for the use of such lands as a site for installation and field testing of an experimental wind turbine generating system. Any permit issued pursuant to this subsection shall contain such terms and conditions as the Secretary determines necessary to protect the values of such lands for purposes of this section.

Terms and conditions

Development and administration

(f) The Secretary shall develop and administer, in addition to any requirements imposed pursuant to paragraph 119(b)(3), a program for the reclamation and restoration of all lands affected by quarrying operations in the area acquired pursuant to subsection 119(d). All revenues received by the United States in connection with quarrying operations authorized by paragraph 119(b)(3) shall be deposited in a separate fund account which shall be established by the Secretary of the Treasury. Such revenues are hereby authorized to be appropriated to the Secretary as needed for reclamation and restoration of any lands acquired pursuant to subsection 119(d). After completion of such reclamation and restoration to the satisfaction of the Secretary, any unexpended revenues in such fund shall be returned to the general fund of the United States Treasury.

Appropriation authorization

(g) There are hereby authorized to be appropriated in addition to that authorized by subsection 119(f), such sums as may be necessary to carry out the provisions of this section.

Appropriation authorization

Appendix B

Memorandum of Understanding
between
Bureau of Land Management, U.S. Coast Guard, and U.S. Fish and Wildlife Service
for the
Yaquina Head Outstanding Natural Area

WHEREAS, The Secretary of the Interior, through the Bureau of Land Management (hereinafter referred to as BLM), is charged with the responsibility to carry out the requirements of Section 119 of the Act of March 5, 1980 (94 Stat. 71; 43 U.S.C. 1783), including the development and implementation of a management plan for the Yaquina Head Outstanding Natural Area (hereinafter referred to as YHONA); and

WHEREAS, BLM administers approximately 80 acres of Federal land within the YHONA, and has an approved management plan in effect which will be implemented on a phased basis as budgets permit; and

WHEREAS, the U.S. Coast Guard (hereinafter referred to as USCG) administers approximately 10 acres of Federal land within the YHONA which are required for lightstation and communication purposes; and

WHEREAS, the U.S. Fish and Wildlife Service (hereinafter referred to as USF&WS) administers the Oregon Islands National Wildlife Refuge which includes several rocks and islands lying immediately offshore from the YHONA which are also part of the Oregon Islands Wilderness; and

WHEREAS, each agency recognizes the need for close coordination in order to: (1) maintain or enhance the USCG's lightstation and communication functions; (2) provide adequate protection for wildlife and wildlife habitat under USF&WS jurisdiction; and (3) facilitate BLM's requirements to manage the scenic, natural and historic resources within the YHONA:

It is hereby agreed as follows:

A. BLM shall:

Consult with the USCG and USF&WS whenever a proposed action or activity may affect USCG lightstation/communication operations or resources under USF&WS jurisdiction, and negotiate the resolution of any issues before the action or activity is implemented.

B. USCG shall:

Consult with BLM and the USF&WS whenever a proposed action or activity may affect management of the YHONA or resources within the YHONA, and negotiate the resolution of any issues before the action or activity is implemented.

C. USF&WS shall:

Consult with BLM and the USCG whenever a proposed action or activity may affect management of the YHONA or resources within the YHONA, and negotiate the resolution of any issues before the action or activity is implemented.

The officials responsible for executing the provisions of this agreement shall be the Salem District Manager for BLM, the Planning Officer for the USCG, and the Refuge Manager, Western Oregon Refuges, for the USF&WS.

This memorandum shall remain in effect until terminated by mutual agreement or upon thirty (30) days written notice by any one of the participating agencies.

The latest date of signature below shall initiate the provisions of this memorandum.

For the Bureau of Land Management:

Oregon State Director — 3/1/85 Date

For the U.S. Coast Guard:

Commander, Thirteenth Coast Guard District — Date

For the U.S. Fish and Wildlife Service:

Regional Director, Region I — 3·18·85 Date

Appendix C

NOV. 18, 1985

Plants of Yaquina Head, Oregon

Margaret B. Marshall
Summer 1985

This list covers vascular plants identified on BLM property at Yaquina Head (YH), Oregon, between 5/24 & 8/25, 1985. It was compiled by an SCA/BLM volunteer (B.A. Biology) rather than a professional botanist. However, every plant was either carefully keyed out or checked against Hitchcock & Cronquist's Flora of the Pacific Northwest (Univ. of Wash. Press, 1976 with corrections); doubts about particular identifications were duly noted. Blooming dates came from Hitchcock et al., Vascular Plants of the Pacific Northwest, and the text and illustrations there were a valuable secondary reference. (YH's blooming dates, where observed to differ, are noted in parentheses.) The list is annotated with relative abundance, location, and clues for recognizing less familiar species and for telling similar species apart. A map of the property is attached.

Due to limited time, instruments, and expertise, the Gramineae, Cyperaceae, and Juncaceae were entirely omitted from the study. Some spring-flowering plants were almost certainly overlooked, and probably a few others as well. Possibly for one of these reasons the following plants from the Oregon Nature Conservancy list of 1977 did not appear in this survey:

Cardamine oligosperma, little western bittercress;
Jaumea carnosa, fleshy jaumea;
Juncus lesueurii, salt rush;
Poa annua, annual bluegrass;
Poa macrantha, seashore bluegrass;
Sanicula arctopoides, footsteps of spring;
Viola langsdorfii, Aleutian violet (perhaps this listing's V. adunca, western blue violet, which is fairly abundant but did not appear on that list);
Viola sempervirens, evergreen violet.

Abbreviations used in this report:

comm rd - communication site road
comm hill - communication site hill
LQR No. - lower quarry road number 1, 2, 3, etc.

Plants of Yaquina Head, 1985:

Equisetaceae — Horsetail Family

Equisetum telmateia, giant horsetail. Abundant.

Polypodiaceae -- Fern family

Athyrium felix-femina, lady-fern. 1 - few, left side of comm rd and left side of LQR2.
Blechnum spicant, deer-fern. With lady-fern on LQR2, also right side of comm rd.

Polypodium scouleri, leather-leaf polypody. E-facing sea cliff by lower quarry.
Polystichum munitum, sword-fern. Abundant.
Pteridium aquilinum, western bracken fern. Abundant.

Pinaceae — Pine Family

Picea sitchensis, Sitka spruce. Abundant.
Pinus contorta, var. contorta, shore or lodgepole pine. Abundant.
Tsuga heterophylla, western hemlock. Few on comm hill (by comm rd & above NE quarry).

Araceae — Arum Family

Zantedeschia aethiopica, calla lily. Escaped from cultivation, fairly abundant on LQR2. Blooms in the early summer here.

Liliaceae -- Lily Family

Allium cernuum, nodding onion. By the path to the south penninsula, & at least 1 clump on comm hillside. Uncommon in OR. Jun-Jul. (done by end of June here).
Disporum smithii, fairy lanterns. Abundant on comm hillside, especially among the trees. Apr-Jul.
Lilium columbianum, Oregon or tiger lily. Fairly abundant on lower comm hillside, some by birdwalk path. Jun-Jul.
Maianthemum dilatatum, wild or false lily-of-the-valley. Abundant. May-Jun.

Iridaceae — Iris Family

Gladiolus sp. Single clump escaped from cultivation, on hillside below LQR2, found blooming in early summer.
Iris tenax, Oregon iris, blue flag. Abundant, especially comm hillside. Apr-June.
Sisyrinchium angustifolium, blue-eyed grass. Common, especially on lawn. Apr-Jul (to June here).
Sisyrinchium californicum, golden-eyed grass. Many in wet parts of LQR2. Jun-Jul.
Tritonia crocosmaeflora, montbretia. Several clumps escaped from cultivation between ends of LQRs 1 & 2. Found blooming in August.

Orchidaceae -- Orchid Family

Habenaria greenei, coastal or dense-flowered rein orchid. Some in the area by lower comm rd, many on comm hillside. Jul-Sep.
Spiranthes romanzoffiana, twisted orchid, lady's tresses. Many in area by comm rd, a few around end of old road by birdwalk path. Jul-Aug.

Salicaceae — Willow Family

Salix hookeriana, coast willow. Here & there by main & lower rds.

Myricacea -- Sweet Gale Family

Myrica californica, western wax myrtle. Above NE quarry. Apr-May.

Betulaceae — Birch Family

Alnus rubra, red alder. Common, mainly on comm hill. Mar-Apr.

Polygonaceae — Buckwheat Family

Polygonum aviculare, knotweed. Narrow, very prostrate, inconspicuous, with tiny axillary flowers. Abundant in waste areas. Jul-Sep.
Polygonum persicaria, heartweed, smartweed, also lady's thumb because of dark patch on most of the leaves.. Spike of pink tepals surrounding shiny black achenes. Top of comm hill, & lower quarry. Mar-Sep.
Polygonum sachalinense, giant knotweed, sachaline. Dense clump opposite upper quarry. Tall, with big leaves. Jul (mid-Aug here) - Sep.
Rumex acetosella, red sorrel. Tiny, dainty red flowers/fruits, hastate leaves. Mainly comm rd. May-Aug.
Rumex crispus, curly dock. Our most abundant dock, by all roads. Valves unfringed, with callosities. Jun-Sep.
Rumex maritima, golden dock. Small, yellow-green, bushy plant. Spike appears fluffy, with long fringe, tiny callosities. Wet parts of lower quarry area. Late Jun-Sep.
Rumex obtusifolius, bitter dock. Valves fringed. Here & there by roads, especially end of LQR1. Mar-Sep.
Rumex occidentalis, western dock. Tall, with big valves lacking callosities. By stairs to beach, & a few spots by roads. Jun-Aug.
Rumex persicarioides, seashore dock. Grows with R. maritima, and looks just like it but the spike is more bulbous than fluffy because the callosities are bigger. Jul-Sep.
Rumex salicifolius ssp. salicifolius, willow dock (apparently). Ours very prostrate. Big callosity almost fills one valve (valves to 4mm & 3mm) in the dense spike. Lower quarry area and end of lower roads. Jul-Sep.

Chenopodiaceae -- Goosefoot Family

Atriplex patula, var hastata, saltbush. (A guess from pictures. In bud 8/25, so couldn't be keyed out.) Hastate leaves. Lower roads, especially end of LQR3 and lower quarry. Jun-Sep.

Found a few small specimens of what looked like another member of this family also in bud in the lower quarry. Small, inconspicuous.

Portulacaceae -- Purslane Family

Montia sibirica, candy flower. Dainty pink/white flower. Abundant in the woods by the road and on comm hill. Mar-Sep.

Caryophyllaceae — Pink Family

Cerastium arvense, field chickweed. Petals much longer than sepals. Abundant. Apr-Aug.
Cerastium viscosum, sticky chickweed. Hairy, petals about equal to the sepals in length, pedicels shorter than either. Some by path up the hill from the trailer. Mar-Jun or later.
Cerastium vulgatum, mouse-ear chickweed. Hairy, petals about equal to sepals, pedicels often longer. Leaves uniquely dark and narrow, plant tends to be prostrate. Comm rd. Early spring - late fall.
Sagina procumbens, procumbent pearlwort. Tiny, mat-forming. On cliffs (some by the stair) and in waste areas. May-Oct.
Silene gallica, windmill pink. Hairy plant with one-sided raceme of long, pinkish white, sticky flowers. Lower roads. May-Jul.
Spergula arvensis, stickwort, cornspurry. Small white flowers, whorled linear leaves. Single plant at the end of LQR1. Mar-Oct.
Spergularia canadensis, Canadian sandspurry. Small white or pink flowers, far-spaced, opposite linear leaves, 2-5 stamens. Not especially hairy. Winged seeds. Lower quarry.
Spergularia macrotheca, beach sandspurry. Hairy-glandular, with especially big pink flowers (sepals 5-9mm), 10 stamens. Lower quarry. Jun-Aug.
Spergularia marina, saltmarsh sandspurry. Hairy-glandular, flowers white or pink, small. Stamens 2-5, seeds unwinged. Lower quarry. May-Aug.
Spergularia rubra, pink sand-mat, red sandspurry. Prostrate, with fascicled leaves and pink-purple flowers. Abundant in all waste areas. Apr-Oct.
Stellaria media, common chickweed. Stem hairy only in one line, leaves not hairy, petals shorter than sepals. Comm rd. Feb-Oct.

Ranunculaceae -- Buttercup Family

Ranunculus occidentalis, western buttercup. Leaves 3-lobed but not compound. Common on lawns. Apr-Jun.
Ranunculus repens, creeping buttercup. Unique in having compound basal leaves, flowers often double, and a tendency to root at lower nodes. Abundant south of LQR2, and on lawns.

Berberidaceae -- Barberry Family

Berberis aquifolium, Oregon grape. Holly-like, yellow flowers. Here and there. Mar-May.

Fumariaceae -- Bleeding-heart Family

Dicentra formosa, bleeding-heart. Unique pink flowers that hang down. Cluster on left side of comm rd. Mar-Jul.

Cruciferae — Mustard Family

Brassica campestris, yellow or field mustard. Tall, with conspicuous yellow flowers. Abundant. Apr-Jun.
Cakile maritima, european sea rocket. Succulent with pinnatifid leaves, pink flowers. South side of lower quarry area. Jul-Aug.

Coronopus didymus, wartcress. Matty, with pinnatifid leaves, dense racemes of tiny white flowers and double silicles. Lower quarry and waste area by upper quarry. Mar-Jul.

Crambe maritima, sea cabbage. Very rare in U.S., but a good clump here at edge of main beach. Conspicuous. May-Jun.

Lepidium perfoliatum, perfoliate peppergrass. Little weed with conspicuously perfoliate leaves. Found 1 plant by main road, opposite upper quarry. Mar-Jun.

Lepidium virginicum, tall peppergrass. Small, bushy little weed with racemes of small white flowers and more conspicuous flattened silicles. Here & there in lower quarry and other waste areas. Mar-Jun (but still a few blooms here in Aug).

Sisymbrium officinale, hedge mustard. Tall, with small cluster of yellow flowers, strongly appressed siliques. Mainly on the comm rd, end of LQR3. Mar-Sep.

Saxifragaceae -- Saxifrage Family

Tellima multiflora, fringe-cups. Tall, showy, fragrant. Several patches by comm rd & lower rds. Apr-Jul (to June, here).

Grossulariaceae -- Currant or Gooseberry Family

Ribes sanguineum, red-flowered currant. Mature shrub above NE quarry. Young plant which may not be the same species was found a short way down the power line from the top of comm hill.

Rosaceae -- Rose Family

Fragaria chiloensis, coast strawberry. Abundant. Apr-Jun.

Rubus discolor, Himalaya blackberry. Big, erect, with 5 lflets. Abundant by roads. Jun-Aug.

Potentilla pacifica, pacific silver weed or cinquefoil. Like a buttercup with pinnately compound leaves, many leaflets. South of LQR2, and in lower quarry area near ocean, extending around cliff. May-Aug.

Pyrus fusca, wild crab apple. White flowers & small fruits in clusters. At least one on comm hill, upper SE slope. Late Apr-early Jul.

Pyrus malus, cultivated apple. Several on comm hillside.

Rosa nutkana, common wild rose, nutka rose. Abundant. May-Jul.

Rubus parviflorus, thimbleberry. Leaves hairy, not divided. Berries red. Especially common on comm rd. May-Jul.

Rubus spectabilis, salmonberry. 3 crinkled lflets. Rose-red flowers, orange berries. Mar-Jun.

Rubus ursinus, wild or trailing blackberry. Usually 3 lflets. Trails along ground, esp. on hillsides. Apr-early Aug.

Spiraea douglasii, spirea. Shrubs with fluffy pink flower spike. At the end of LQR1 there are quite a few.

Cotoneaster sp. (I suspect, judging by pictures only). Several on comm hillside - the same plants I keep seeing in neighbors' yards. Small, entire, pointed, somewhat wooly lvs, line of small fruits.

Leguminosae — Pea Family

Cytisus scoparius, scotch broom. A few young plants, not yet blooming, on lower roads.
Lathyrus japonicus, purple beach pea. A few in lower quarry area, and below LQR2. Big purple flower. Stigma hairy only on the upper side, unlike vetches with the stigma hairy all around the tip. May-Jun.
Lotus corniculatus, bird's foot trefoil. Compact cluster of conspicuous. yellow flowers. Top of comm hill, and LQR3. May-Sep. Like all Lotus, lacks tendrils.
Lotus crassifolius, thick leaved lotus. Large. Its dainty white flowers are veined & tinged with rose. Along the path to the South penninsula. May-Jul (to June here).
Lotus formosissimus, seaside lotus. Flowers have pink wings, yellow banner. Upper comm hillside, also above main beach. May-Jul (probably to June here).
Lotus purshiana, Spanish clover. Small matting plant on lower quarry roads, other waste areas. Has a small, single white flower. Apr-Sep.
Melilotus alba, white sweetclover. Racemes of very fragrant white flowers. A single plant on top of comm hill.
Trifolium dubium, suckling clover, small hop clover. Small, loose, yellow flower head. Abundant on lawns, by roads. Apr-Sep (not noticed past July here).
Trifolium pratense, red clover. Abundant. Jun-Aug.
Trifolium procumbens, hop clover. Head fuller, larger than in T. dubium. NE quarry and nearby road, also below LQR2. May-Aug.
Trifolium repens, white clover. Abundant. Apr-Sep.
Trifolium wormskjoldii, springbank clover. Looks much like red clover, but the flowers are white-tipped, plant smaller. Abundant. May-Sep.
Vicia americana, American vetch. Purple. Comm rd & hillside. May-Jul.
Vicia gigantea, giant vetch. Flowers pink-tinged amber. Most noticeable by the stairs & north side of main road. May-Jul.
Vicia hirsuta, tiny vetch. Looks delicate, with 3-5 small white flowers in raceme. 1-few by main roads. May-Jul.
Vicia sativa, common vetch. 1 or 2 sessile pink flowers in leaf axil, midrib extends past end of leaflet. All over. May-Jul.
Vicia tetrasperma, slender vetch. Small, 2 flowered, white with pink veins. A few by first half of LQR2. May-Aug (Perhaps only to July here).

Geranaceae — Geranium Family

Geranium dissecteum, cut-leaf geranium. Small pink flower, deeply 5-cleft and further lobed leaves. Here & there, especially by lower roads. Mar-July.

Aquifoliaceae — Holly Family

Ilex sp. Escaped from cultivation. A few specimens in wooded parts of comm hill, one on hillside above Agate Beach.

Rhamnaceae — Buckthorn Family

Rhamnus purshiana, cascara. Tree with oval leaves, veins making prominent parallel ridges. Upper comm hill.

Malvaceae -- Mallow Family

Malva neglecta, cheese-weed (because fruit resembles wheel of cheese). Flowers are like a pink & white-striped morning-glory. Leaves reniform, 5-lobed. Healthy patch on little ridge between road & SE pullover. May-Sep.

Hypericaceae -- St John's-wort Family

Hypericum perforatum, Klamath weed, common St. John's-wort. 5 yellow petals edged with black dots, many stamens, delicate foliage. Here & there by roads & on hillside. Jun-Jul (into August here).

Violaceae -- Violet Family

Viola adunca, western blue violet. This violet has a long slender spur and a hairy stigma. Mainly around birdwalk path and with the twisted orchids by lower comm road. Apr-Aug.

Lythraceae -- Loosestrife Family

Lythrum hyssopifolia, hyssop loosestrife. Patches of inconspicuous erect stems with axillary narrow purple flowers. Lower quarry, near marsh. May-Sep.

Onagraceae -- Evening Primose Family

Epilobium angustifolium, fireweed. Abundant. Jun-Sep.
Epilobium watsonii, Watson's willow-herb. Scattered but abundant. Jun-Aug.
Oenothera sp., evening primose. Probably .O. erythrosepalia escaped from cultivation (common in gardens here). Possibly O. hookeri; most characters seem midway between the two. Large yellow flowers. On both sides of eastern main road. Jun-Sep.

Araliaceae -- Ginseng Family

Hedera helix, English ivy. Escaped from cultivation, on tree below turn of comm road. May-Jun.

Umbelliferae -- Parsley Family

Angelica hendersonii, Henderson's angelica. Wooly under leaves. Abundant. Jul (mid June here) - Aug.
Angelica lucida, sea watch. Not wooly under leaves. Less common; some by the fence south of the light house. Jul (mid-June here) - Aug.
Daucus carota, wild carrot, Queen Anne's Lace. Common. Lacy leaves and umbel. July (mid-June here) - Aug.
Heracleum lanatum, cow parsnip. Abundant. "Jun-Aug" (more like May-Jun here)
Sanicula crassicaulis, snake-root. Tall, with an inconspicuous yellow flower cluster. Mainly by lighthouse path.

Ericaceae -- Heath Family

Arctostaphylos uva-ursi, kinnikinnic, bearberry. Prostrate with small evergreen leaves. Found patches to the right of birdwalk path, on south penninsula & above NE quarry. Apr-Jun.
Gaultheria shallon, salal. Abundant. May-Jul.
Vaccinium ovatum, evergreen huckleberry. Shiny, evergreen, toothed leaves. Many by the orchids to the right of comm rd, also a few by comm rd & above NE quarry. Apr-Aug.
Vaccinium parviflorum, red huckleberry. Non-evergreen leaves. red berries. A few scattered on comm hill, including comm rd. Apr-Jun.

Primulaceae -- Primose Family

Anagallis arvensis, pimpernel. Pretty little orange-red flower. Here & there by roads. Lots in the lower quarry, some by the stairs. "May-Jun" (to August here).
Trientalis latifolia, star-flower. Pretty white flower suits its name. Saw a few under dense growth above the NE quarry. Apr-Jul.

Plumbaginaceae -- Leadwort Family

Armeria maritima, sea thrift. Flower is a pink pom-pom. Especially visible around the lighthouse. Mar-Jul.

Gentianaceae -- Gentian Family

Centaurium umbellatum, centaury. Pink, similar to willow-herb but with 5 petals. A few plants at the end of LQR2. Jun-Aug.

Convolvulaceae -- Morning-glory Family

Convolvulus sepium, hedge bindweed. White-flowered vine common by main & lower roads. May (June here) - Sep.

Hydrophyllaceae -- Waterleaf Family

Romanzoffia tracyi, Tracy's mist maiden. Uncommon in OR. On sea-cliffs from the main beach to the lighthouse. Mar-Apr. This year ours were brown, dry by June.

Labiatae — Mint Family

Prunella vulgaris, heal-all, self-heal. Low plant with unique thick purple spike. Common by roads, in lawns. May (June here) - Sep.
Stachys mexicana, hedge nettle. Abundant. Jun-Aug.

Scrophulariaceae -- Figwort Family

Castilleja litoralis, coast paintbrush. Scarlet, unique flowers. Patch by the toilets and another beyond the north fence. Apr-Sep.
Digitalis purpurea, foxglove. A few south of LQR2. Mostly Jun-Jul.
Mimulus guttatus, common monkey flower. Bright yellow flower. This specie has palmately veined leaves. Abundant on the cliffs & in quarries. Mar-Sep.
Orthocarpus castillejoides, paintbrush orthocarpus. Green with white-tipped bracts. Single plant near marsh, lower quarry. Jun-Sep.
Parentucellia viscosa, parentucellia. Pale to medium yellow, sticky. LQR5 (abandoned) Jun-Aug.
Scrophularia californica, figwort. Maroon flowers. Especially around comm rd. Jun-Aug.
Veronica americana, American brookline. Dense patch beyond end of LQR3. May-Jul.

Plantaginaceae -- Plantain Family

Plantago lanceolata, English or buckhorn plantain. Long non-succulent leaves. Abundant. Apr-Aug.
Plantago major, broad-leaved plantain. Leaves. almost round. Abundant, especially on bare ground. May-Aug.
Plantago maritima, sea-side plaintain. Fairly narrow, succulent leaves common on & around cliffs, also lower quarry area. Jun-Aug.

Rubiaceae -- Madder Family

Galium aparine, goose-grass. Flowers small, white. Leaves narrow, very "catchy". Common, by most roads and along the lighthouse path. Apr-Jun.
Galium triflorum, fragrant bedstraw. Leaves elliptic, not "catchy". In woods of comm hill. Jun-Aug.

Caprifoliaceae -- Honeysuckle Family

Lonicera involucrata, twinberry. Abundant. Apr-Aug.
Sambucus racemosa, red elderberry. Toothed, pinnately compound leaves, inverted cup of white flowers then red berries. Common along the upper comm rd. Mar-Jul.

Dipsicaceae -- Teasel Family

Dipsacus sylvestris, common teasel. Tall, unique. Spiny leaves. Spiny purple flower stalk. Abundant by lower roads.

Cucurbitaceae -- Gourd Family

Marah oreganus, wild cucumber, old-man-in-the-ground. Abundant. Apr-Jun (to Aug. here).

Achillea millefolium, yarrow. White flower clusters, soft feathery leaves. Abundant. Apr-Oct.

Anaphalis margaritacea, pearly everlasting. White flower clusters, leaves. entire, wooly when young but turn darker. Abundant. Jul-Sep.

Anthemis arvensis, corn chamomile. Very similar to A. cotula. A few plants at the turn of comm rd.

Anthemis cotula, dog fennel, stinking mayweed. Small-flowered, fine-foliaged, smelly daisy. Thick on top of comm hill. May-Oct.

Aster chilensis, California aster. All over YH. Flower color varies from bluish to less often pinkish or white.

Bellis perennis, English daisy. Pink tinged white daisy in lawn. Mar-Sep (not later than July here).

Bidens cernua, nodding beggarstick. Like a sunflower, in the marsh at the lower quarry. July-Sept.

Chrysanthemum leucanthemum, ox-eye or common daisy. Abundant. May-Oct.

Cirsium hallii, Hall's thistle. Stems hairy, not spiny. Here & there, but less common than C. vulgatum. Nice patch on the little hill west of the upper quarry entrance. Jul-Sep.

Cirsium vulgatum, Bull thistle. Stem is spiny due to the decurrent leaves. Dots Yaquina Head with purple. Jul-Sep.

Cotula coronopifolia, brass buttons. Fairly small, with yellow button-flowers. Lower quarry area, southj of the road. Jun-Sep.

Crepis capillaris, smooth hawksbeard. Tall, branched, non-prickly, rather small-flowered yellow composite. Here & there by roads. May-Nov.

Erechtites prenanthoides, Australian fireweed. Big, much-branched, no ray flowers so it appears to be always budding. Visible from comm rd in several places, also below end of LQR2. Seems to bloom mainly Jul-Aug here.

Erigeron glaucus, sea-side daisy. Lower purple daisy, abundant in the lawn, around cliffs. May-Aug.

Gnaphalium purpureum, purple cudweed. Very white-wooly. Common, especially in waste areas. May-Oct.

Hypochaeris radicata, false dandelion. Branched flower stalk, leaves stiff-hairy, pinnatifid.

Lasthenia minor, ssp. maritima, sea-side gold fields, hairy lasthenia. Uncommon in OR. Little yellow flowers right around the nesting gulls on the point. "Jul-Sep" (actually May here!).

Leontodon nudicaulis, hairy hawkbit. Much like Hypochaeris, but unbranched. Leaves less deeply lobed.

Matricaria matricarioides, pineapple weed. Abundant in waste areas. May-Sep.

Senecio bolanderi, bolander's groundsel. Yellow flowers, somewhat like tansy ragwort. Around the north and south penninsula and down slope to the lower quarry area. Much larger specimen located above NE quarry. Jun-Jul.

Senecio jacobaea, tansy ragwort. Abundant. Jul-Sep.

Senecio vulgaris, common groundsel. Lacks rays; just has inconspicuous elongate disc flowers. Few plants along the LQR3.

Solidago canadensis, canada goldenrod. Abundant. Jul-Oct.

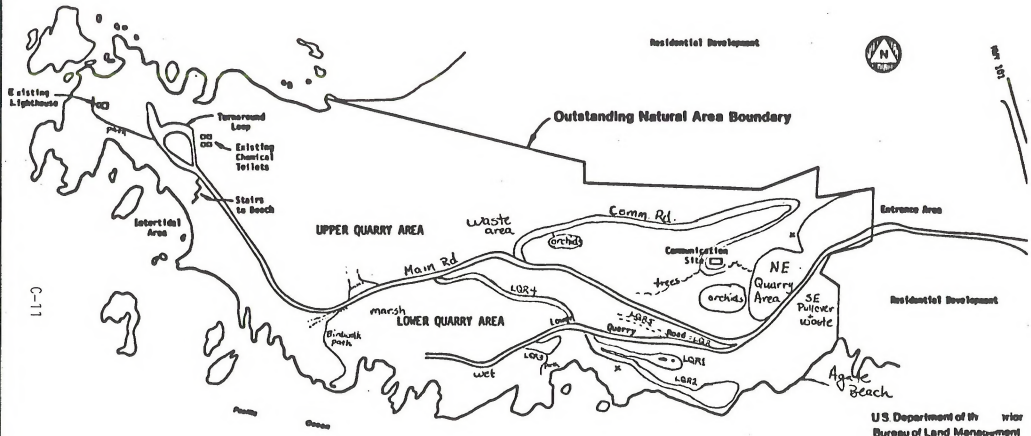
Solidago spathulata, var. spathulata, sticky goldenrod. Thick patch near orchids, to the right of lower comm rd. Shorter, with mainly basal spatulate leaves. The individual flowers are larger than in S. canadensis. Jun-Jul.

Sonchus asper, prickly sow thistle. Tall, yellow, prickly. Clasping leaf bases curve, so they are not pointed. Seeds are flat, not wrinkled. Abundant, especially by roads & cliffs. Jul-Oct.

Sonchus oleraceus, common solo thistle. Very similar to S. asper, but the leaf bases are more pointed, and the seeds are wrinkled. Abundant in some places. Jul-Sep.

Tanacetum douglasii, sea-side or northern dune tansy. Yellow disk flowers, dissected but stiff leaves. Abundant. Jun-Sep.

Taraxicum officinale, common dandilion. Smooth leaves. Here & there by the sides of roads. Jun-Sep.



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YAQUINA HEAD OUTSTANDING NATURAL AREA

August 1985
MAP FOR PLANT SPECIES LIST.

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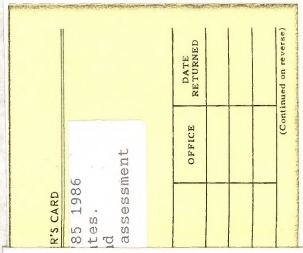

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Project plan and
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